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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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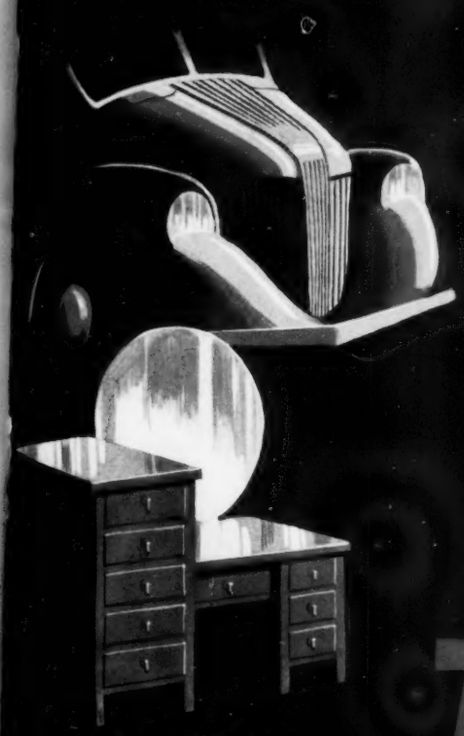

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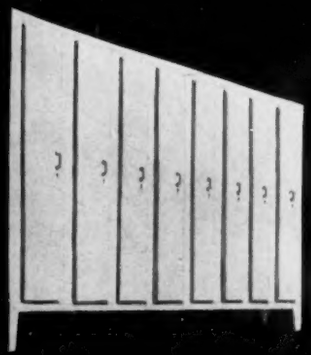

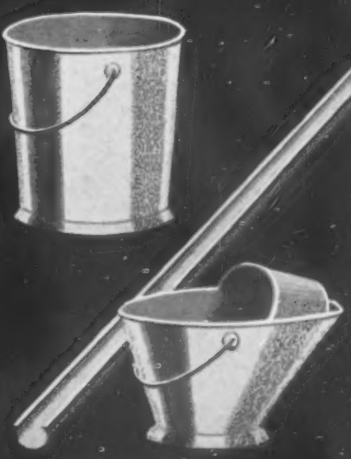

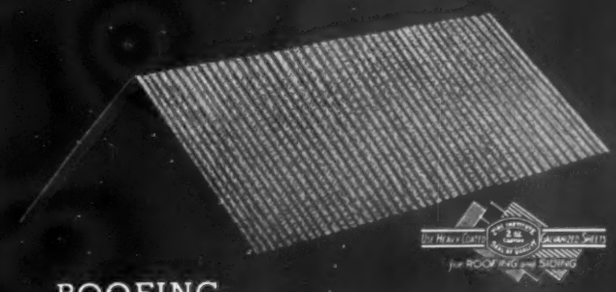

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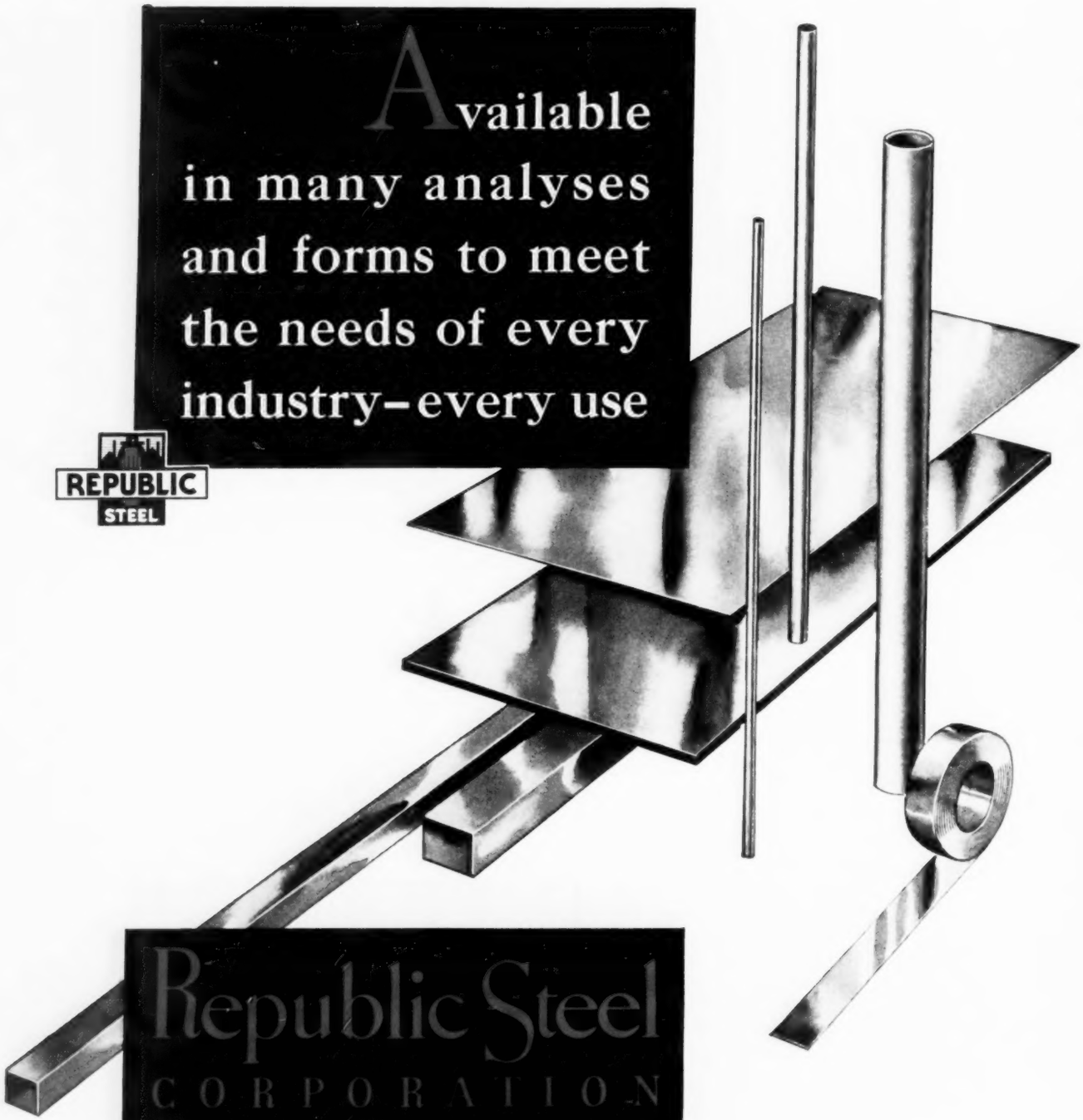

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STEEL

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MOLY increases the pay load by decreasing the dead load

FREIGHT haulage is the railroad's "bread and butter." One way to lower operating costs is through lighter, yet stronger, load-carrying rolling stock. It permits larger pay loads per car or more cars per train; less strain (particularly in starting) and less fuel consumption.

"Moly" steels have an important bearing on this pay-load/tare-load ratio. They are stronger per unit section, and are readily welded — permitting lighter construction. Frames and bodies can be made lighter, wheels stronger and more wear resisting, by using Moly steels.

"A little Moly does a lot," therefore Moly steels cost less than other alloy steels having equivalent properties for a given purpose. They cost but slightly more at first than plain carbon steels, and cost much less in the long run.

That is not the whole story by any means. Moly steels reduce wear, breakage, and destruction from corrosion. Consequently, maintenance and depreciation costs are reduced. Summed up, Moly steels will make a notable reduction in over-all operating costs, on a train-mile or any other basis.

Innumerable instances prove Moly's worth. Our book, "Molybdenum," gives valuable technical data. Yours for the asking — as is also "The Moly Matrix," our periodical news-sheet. Climax Molybdenum Company, 500 Fifth Avenue, New York.

CUTS COSTS CLIMAX Mo-lyb-den-um CREATES SALES

As the Editor Views the News

INDUSTRY has a dual interest in the Supreme Court's decision outlawing AAA. Naturally it wonders whether the passing of the Triple A will affect the purchase by farmers of automobiles, agricultural implements and other manufactured articles. Secondly, it is curious to know whether the sweeping character of the majority opinion may be construed to mean that some of the other new deal legislation awaiting court action is likely to be declared unconstitutional. Administration spokesmen have been reluctant to answer these questions positively. This reticence is in marked contrast to the cocksure predictions of calamity they uttered immediately following the NRA decision.

• • •

Watch Effect of AAA Ruling

Motordom, which is alert to influences which affect the purchase of automobiles, apparently has not had time to make up its mind on the effect of the decision. Some observers (p. 16) believe that the bulk of farm buying of motor cars based upon returns from 1935 crops was completed before Jan. 1. A number of authorities expect that bonus money in the hands of ex-service men will more than make up for the stoppage of the "gentle rain of AAA checks" in the farm belt. In Washington, where opinion is sharply divided, one faction (p. 18) believes that "agriculture will snap back as industry did after the NRA decision." We are inclined to concur with this view.

• • •

How to Control Finish Quality

Manufacturers of refrigerators, washing machines, stoves, metal furniture, etc. who recognize the importance of maintaining uniform standards in the finish of their products, know that dependable purchase-control of the finishing materials is essential. Such control should cover the color, specific gravity, consistency, per cent of nonvolatile ingredients and covering power of the finishing materials. The detailed suggestions for applying these tests (p. 32) should prove valuable to every reader who is identified with the manufacture of products requiring an attractive or durable finish. . . . If you are wondering whether or not a new machine will justify itself in your plant, we suggest that you study the "equipment replacement statement" (p. 42) prepared in reply to an inquiry from a Pacific coast manufacturer. It is a simple formula that can be applied to many types of machine tools and similar equipment.

• • •

Is Change in Charging Due?

Charging of material into metallurgical furnaces undoubtedly will undergo marked changes within the next few years. Considering the advances which have been made in material handling in numerous branches of the metalworking industries, it seems inconceivable that we shall continue indefinitely the prevailing practice of inserting small charges through restricted furnace openings. A possible hint as to the trend of development is furnished by a type of electric furnace (p. 41), in which the charge is delivered through the top. This arrangement permits the handling of bulkier scrap and is claimed to reduce operating and maintenance costs. The idea of charging furnaces in large batches has a strong appeal; it may be applied to other types of melting units.

• • •

Strip Steel Leads Advance

According to the American Iron and Steel institute, steel ingot output in 1935 (p. 15) amounted to 33,425,576 tons, a gain of about 31 per cent over 1934. The increase in 1934 over 1933 was 10 per cent. In looking beyond the totals to ascertain the form of steel in which the gains in 1935 were most pronounced, we find that strip steel (p. 23) made the greatest advance, and that bars, sheets, wire products and tin plate also registered important increases. It is significant that in 1934 the principal gains were made by an entirely different set of products—rails, track accessories, structural shapes, and pipe and tubing. The ascendancy of automobiles and farm puchases in 1935 probably was an important factor in the shift.

E. L. Shaner

Employment Insurance Starts; Costs Steel 6 Millions in 1936

Notwithstanding the fact that the Supreme Court decision invalidating the A.A.A casts a deep shadow over all new deal legislation, including the social security program, industry at the moment is faced with the reality of conforming, for the time being at least. Technically, unemployment insurance became effective Jan. 1 from the standpoint of the levy on manufacturers. Herewith is a brief explanation of what is expected from industry, what certain "key" states are planning, and how the iron and steel industry is meeting the situation

BEGINNING this year, the iron and steel industry will be required to pay at the rate of about $6,000,000 annually for unemployment insurance under the social security act—unless that act, like the NRA and AAA, is declared unconstitutional.

As production and employment increase, so will the outlay for insurance, although not quite in the same ratio, because within certain ranges output may be stepped up without a corresponding proportionate rise in number of employes.

It remains to be seen how great will be the urge in all industrial operations to stabilize employment, and to take advantage of labor-saving devices.

The estimate of cost is based on employment and payroll figures as in November, currently issued by the American Iron and Steel institute, and showing that in that month iron and steel payrolls totaled $49,170,940, or at the rate of $590,051,280 a year.

Payments Triple in 1938

This year every employer of eight or more persons must pay a tax of 1 per cent on his total payroll. In 1937 this tax will be raised to 2 per cent. In 1938 and thereafter it will be 3 per cent.

One per cent of the indicated year's payroll is $5,900,512. By 1938, on the same basis of employment as today—omitting the probability of increase for the sake of specific comparison—the industry would be paying three times this amount, or $17,701,536. This is independent of the old-age pension provisions of the act, which will take additional millions before that time.

In November, when the payrolls amounted to $49,170,940, the number of employes was 438,370. The steelworks operating rate was 54.7 per cent, and steel ingot production was 3,153,247 gross tons. The insurance for such a month would be $491,709, or $1.12 per employe. It would add slightly more than 12 cents a ton to the cost of producing the ingots.

The unemployment feature of the act provides that if a state has an insurance law meeting federal requirements it may receive a rebate of 90 per cent. This, however, does not mean an exemption from the payment of that 1 per cent by employers; the rebate goes into the state's funds for the general administration of its legislation.

Urge Uniform Plans

To start the ball rolling, the federal government has appropriated $4,000,000 for the fiscal year ending June 30, 1936, for distribution to those states "coming in," and the act provides for $49,000,000 for each year thereafter, to be distributed in proportion to the numbers employed. The idea is to induce the states into joining in a general, and nearly uniform insurance plan.

Only ten states so far, however, have passed such legislation, and in nearly all the others there is some contention as to advantages, and disadvantages of the system, and how it shall be constituted.

The Supreme Court's ruling on the NRA, now followed by that on AAA, has led many legislative bodies to go slow, because of the possibility of becoming involved in a system which might be declared unconstitutional.

In that event, the fear seems to be that the states will be "saddled" with unemployment insurance, difficult or impossible of fulfillment. This is now the situation in Ohio, where the legislature is debating the subject—and it is typical of the others where law-making bodies are in session.

Proposals for carrying out the provisions of the act have been introduced in practically all the states—with the view to taking advantage of the rebate. These follow the general pattern of the federal act, providing for a payroll tax of 1 per cent, increased to 2 and then to 3 per cent. A bone of contention, however, is whether the funds so derived shall be pooled "for the general good," or placed to the credit of those employers contributing.

In some states there have been introduced several different so-called "conformity bills." These vary in important respects as to the administration of the funds, and also as to the length of time and amounts of benefits to be paid. Ostensibly as a "protective" measure—but in reality giving the federal government a further grip on the states—the security act provides that for them to receive the federal benefits and rebates they must enact such compensation laws as the Social Security board—a federal body—may approve.

Benefits will not begin before 1938, and they are limited to $240 to one person in one year. Organized labor apparently is not lined up solidly behind the proposed legislation, judging from appearances in several of the state legislatures. Spokesmen refer to the act as a "subterfuge," and "inadequate." They call attention to features which follow closely unemployment insurance systems in effect in European countries—and question the ultimate benefits.

An intangible, but nevertheless expensive item, in addition to the tax, is the cost of keeping records as provided in the security act. Appeals have been made for some modification of the rules.

Instructions Are Issued

In connection with these records, Guy T. Helvering, commissioner of internal revenue, has issued regulations as follows:

"Every person subject to tax under the act shall, during the calendar year 1936 or any calendar year thereafter, for such calendar year, keep such permanent records as are necessary to establish:

"(1) The total amount of remuneration payable to his employes in cash or in a medium other than cash, showing separately, (a) total remuneration payable with respect to services excepted by section 907 (c), (b) total remuneration payable with respect to services performed outside of the United States and (c) total remuneration payable with respect to all other services.

"(2) The amount of contributions with respect to employment during the calendar year paid by him into any state unemployment fund, showing separately, (a) payments made and not deducted (or deductible) from the remuneration of employes, (b) payments made and deducted (or deductible) from the remuneration of employes, (c) payments made with respect to services excepted by section 907 (c).

"(3) Such other information as will enable the commissioner to determine whether such person is subject to the tax, and, if subject to the tax, the amount thereof.

"(b) No particular method of accounting or form of record is prescribed. Each person may adopt such records and such method of accounting as may best meet the requirements

of his own business, provided that they clearly and accurately show the information required above, and enable him to make a proper return on the prescribed form.

"(c) Records are not required to show the number of individuals employed on any day, but must show the total amount of remuneration actually paid during each calendar month and the number of individuals employed during each calendar month or during each such lesser period as the employer may elect.

"(d) Any person who employs individuals during any calendar year but who considers that he is not an employer subject to the tax (see paragraph D, above), should be prepared to establish by proper records (including, where necessary, records of the number of persons employed each day) that he is not an employer subject to the tax.

"All records required by these regulations shall be kept safe and readily accessible at the principal place of business of the person required to keep such records, or at such other place or places as the commissioner, upon written application by the person concerned, may approve. Such records shall at all times be open for inspection by internal revenue officers, and shall be preserved for a period of at least four years from the due date of the tax for the calendar year to which they relate."

Pensions Start Next Year

Taxes for old-age pensions will not begin until Jan. 1, 1937. They will start at 1 per cent of payrolls for that year, and increase to 3 per cent by 1949. Employers will deduct the tax from pay envelopes, and match it with an equal sum as their contribution. Only the period of employment after Dec. 31, 1936, and before reaching the age of 65 will count as service toward a pension.

No pension will be granted until 1942. One of the requirements is that an employe must have received wages or salary on at least one day in each of five years after Dec. 31, 1936; and, in addition, this must occur before he reaches the age of 65, for him to qualify for a pension. Also, he must have received at least a total of $2000 in wages or salary after Dec. 31, 1936, and up to the age of 65.

Steel companies already are beginning to acquaint their employes with the provisions of the law. One of the leading companies in its plant publications is presenting lists of questions — such as any worker might ask — and the answers.

What to do with their present pension systems is a problem with many steel and metalworking companies which have had group insurance policies covering pensions in effect for years. The United States Steel Corp. now is paying out about $7,700,000 annually to its pensioners; Bethlehem Steel Corp., $830,000. The former has 12,282 on its list; the latter, 1862.

Standard Oil Co. of New Jersey has formulated a plan whereby it will supplement the federal pension plan with one of its own, with the purpose of promoting thrift and increasing pension benefits.

"The act will raise $9,000,000,000 in payroll taxes from American workers and industry between now and 1942, when 1,100,000 people will start to receive insignificant old-age benefits," according to a pamphlet-editorial by Allen W. Rucker, in collaboration with N. W. Pickering, president, Farrel-Birmingham Co. Inc., Ansonia, Conn.

Preparations B ing Made

Illinois and Indiana employers in the iron, steel and metalworking industry are awaiting the outcome of proposed state legislation. A state unemployment insurance bill has been introduced at Springfield and currently is under consideration by Illinois lawmakers. Indiana's legislature at present is idle, but there is talk of a special session at which unemployment insurance would be acted upon.

Steel companies and other employers in the meantime have started to earmark a sum equal to 1 per cent of their payrolls for the tax which, as provided by the national act, is to be paid by Jan. 31, 1937, or in four equal installments beginning on that date.

While employers are making provisions to pay the tax when due, some doubts exist as to whether the social security act will stand Supreme Court scrutiny. Adverse decisions on the NRA and AAA have tended to increase this doubt though these measures were concerned with different matters than are covered by the social security bill. Illinois has passed an old-age pension act but has yet to approve legislation necessary to put it in force.

The unemployment insurance bill is given a 50-50 chance of passage, despite opposition by various bodies. Such organizations as the Illinois Manufacturers' association, Chicago association of commerce, Illinois chamber of commerce and the Employer's Association of Illinois have lined up against it.

Illinois employers of all types face a bill of $20,000,000 for the 1936 unemployment tax, with this sum doubling in 1937 and tripling in 1938, according to an estimate by the Illinois Manufacturers' association. Steel companies in the Chicago district, which includes Lake county, Indiana, (Gary) will be assessed more than $500,000 this year, it is estimated. For all metalworking plants, the tax in the Chicago district likely will be more than $1,250,000.

"The tremendous expenditures planned by our government over the next few years, added to the large current deficit, make further increases in taxation inevitable," says Continental Can Co. Inc., in a message to stockholders.

"Using the results of 1935 as a basis, the company estimates approximately $1 a share will be required to cover its tax bill for that year.

"By 1938, assuming no further changes are made or new legislation enacted in the meantime, the amount required, including taxes under the so-called security measures, will approximate $1.35 a share."

A Capital Wye in Steel

This steel plate wye, measuring 13 feet 4 inches in diameter at the large end, is part of over 500,000 pounds of plate steel penstock fabricated recently by the Allis-Chalmers Mfg. Co., Milwaukee, for the Platte valley public power and irrigation district, North Platte, Nebr.

Meetings

FOR the fourth consecutive year, the Michigan State college is joining with the Detroit chapter of the American Foundrymen's association in holding a foundry conference at East Lansing, Mich. The conference is scheduled for Feb. 7. Three sessions will be held—one in the morning, one in the afternoon, and an evening dinner meeting.

The general subject for discussion will be "The Properties of Gray Iron Castings as Affected by Superheating Temperatures."

Vaughan Reid, president, City Pattern Works and chairman of the Detroit chapter, Detroit, will preside at the evening dinner meeting. Local arrangements are in charge of Frederick G. Sefing of the staff of the College. All foundrymen and others interested are invited to attend. No registration fee is being charged.

MACHINERY DEALERS TO ELECT

National Association of Used Machinery and Equipment Dealers, 55 Water street, Pittsburgh, will hold its annual meeting for the election of officers and directors at the William Penn hotel, Pittsburgh, Jan. 18.

STEEL PRODUCTION, QUALITY ON A.I.E.E. PROGRAM

Winter convention of the American Institute of Electrical Engineers will be held Jan. 28-31 in the Engineering Societies' building, 33 West Thirty-ninth street, New York. On the program are these papers of special interest to the iron and steel industry:

"Power Company Service to Arc Furnaces," by L. W. Clark, Detroit Edison Co.; "Magnetic Alloys of Iron, Nickel and Cobalt," by G. W. Elmen, Bell Telephone Laboratories Inc.; and "Silicon Steel in Communication Equipment," by C. H. Crawford and A. G. Laird, Bell Telephone Laboratories Inc.

TOOL ENGINEERS SOCIETY FORMS CLEVELAND BRANCH

American Society of Tool Engineers, Detroit, whose membership comprises practical manufacturing executives, such as master mechanics, works managers, tool engineers, tool designers, and the like, recently broadened its activity with the chartering of a Cleveland chapter. The new group has 33 charter members at the start of a membership campaign.

Rudolph A. Fintz, plant layout engineer, White Motor Co., has been elected chairman; G. J. Hawkey, president, Cleveland Duplex Machinery Co., Penton building, secretary; and Frank Jeffs, engineer, Cleveland Universal Jig Co., treasurer. Meetings are to be held on the second Thursday of each month.

Ferdinand Jehle, research engineer, White Motor Co., addressed the first regular meeting of the chapter, Jan. 9, on the subject of research.

F.E.M.A. MEETS FEB. 8

Annual meeting of the Foundry Equipment Manufacturers' association, Penton building, Cleveland, will be held Feb. 8 at the Cleveland hotel, Cleveland. Arthur J. Tuscany is secretary. Three directors will be elected, plans for the Detroit convention of the A.F.A. will be discussed, and a program of broader activity for the association will be presented.

CALL TEXAS WELDING MEET

Texas Technological college, mechanical engineering department, Lubbock, Tex., will hold its second annual welding conference Feb. 13-14. All persons interested in welding are invited to attend, and manufacturers of welding equipment will display and demonstrate their equipment. Lectures and motion pictures on various phases of welding will be held in the morning, and exhibits and demonstrations in the afternoon. No charge will be made for the conference. Preparations are being made for an attendance of 500.

Asks Tariff To Safeguard Labor

A PLEA for a tariff which will exclude foreign steel and permit fair wages and earnings for domestic industry was made by William A. Irvin, president, United States Steel Corp., in an address delivered at the Union League club, Chicago, Jan. 9.

His talk, entitled "Steel as a Barometer," touched on the importance of the steel industry as an indicator of general industrial activity.

Mr. Irvin also pointed out that ownership of the steel industry has passed from individuals to a large group of share holders and from individual management to group management.

Indicating that its success benefits employes as well as stockholders and management, he stated that legislation which prevents satisfactory relationship between these three classes is against the interest of any one of them. Legislation and taxation which discourage capital accumulation work towards the same end, he added.

"As an instance, I call attention to our reciprocal trade agreement act and its administration," said Mr. Irvin. "Our markets are being unsettled by the revision downward of the tariff on many of our manufactured products, including iron and steel.

"How can we maintain our wage structure and keep up workmen's present standard of living if foreign subsidized products are permitted to compete in our markets?

"In many of the foreign countries wage rates are less than one-half that of our industry. Coupled with low wages—the cost of ocean freight from Germany to New York is only 60 per cent of the rail transportation cost from Pittsburgh to New York."

J & L Officials In 3-Day Session

OVER 250 executives and sales representatives of Jones & Laughlin Steel Corp. attended a three-day conference in Pittsburgh, Jan. 2-4. The program included two days of plant inspection, and the third was devoted to an all-day conference.

In addition to representatives from all of the company's district offices and warehouse salesmen from United States and Canada, representatives of the operating, metallurgical, accounting, credit, order, and other departments whose activities are related to sales also attended.

At the conference held Jan. 4 various department heads discussed the problems of co-ordinating the efforts of their departments with those of the district and local sales offices and warehouses. This session was followed by a dinner at the Duquesne club. Speakers at this all-day session were:

S. E. Hackett, president; W. B. Todd, vice president in charge of sales; J. C. Foster, general manager of sales; Philip Schaefer, manager of tin plate sales department; R. T. Rowles, manager of hot rolled sales department; J. D. Allen, manager, cold finished sales department; A. W. Herron Jr., manager, wire sales department; W. H. Wiewel, manager, tube sales department; M. W. St. John, manager, by-products sales department; R. J. Stayman, manager, steel construction and fabricating; Edward A. France, manager of sales for the Cleveland district; B. F. Jones III, secretary and vice president; W. H. Dupka, assistant secretary and controller; F. E. Fieger, vice president and general manager; F. E. Jamieson, manager of order department; H. W. Graham, general metallurgist; W. S. McKee, credit manager; H. E. Graham, general traffic manager, and G. C. Congdon, advertising manager.

Sharon Buys into Pittsburgh Steel Co.; Expect Merger To Result

SHARON STEEL HOOP CO., Sharon, Pa., of which Henry A. Roemer is chairman and president, has purchased a large block of preferred and common stock of the Pittsburgh Steel Co. through Speyer & Co., bankers, of New York.

The extent of the affiliation between the two companies has not yet been definitely stated, but a merger eventually is regarded as certain.

The combined capitalization of the two companies, provided they affiliate closely, would be $35,700,000 of common and preferred stock, and their combined funded debt would be $13,276,000.

Williams Plans To Retire

Such a combination would possess three blast furnaces with pig iron producing capacity of 635,000 tons annually, 18 open-hearth steel furnaces producing 1,200,000 tons of steel ingots, and 915,000 tons of finished rolled products covering a wide range.

It will be recalled that early in November announcement was made that H. D. Williams, president of Pittsburgh Steel Co., would retire on Feb. 1, 1936, after having spent 55 years in steel industry. Mr. Williams resigned as president of the Carnegie Steel Co. effective Oct. 31, 1925, and two days prior was elected president of the Pittsburgh Steel Co. and the Pittsburgh Steel Products Co.

What Sharon Produces

The Sharon Steel Hoop Co. has works at Sharon, Pa., and Lowellville and Youngstown, O. It produces pig iron, ingots, slabs, sheet bars, hot and cold-rolled sheets, light plates, flat bars, hot and cold-rolled stainless steel strip, hoops and bands. Its producing capacity is 230,000 tons of hot-rolled strip, 44,000 tons of cold-rolled strip, and 24,000 tons of galvanized strip. It has issued $1,875,000 of common stock, has a funded debt of $5,600,000.

The company has a meeting scheduled for Feb. 27 to adjust its capital structure (STEEL, Jan. 6, p. 312) and to change its name to the Sharon Steel Co.

The Pittsburgh Steel Co., incorporated July 1, 1901, in Pennsylvania, has works at Monessen, Allenport, Glassport and Alicia, Pa.

At Monessen it has 12 open-hearth (95-ton) furnaces, two blast furnaces, Garrett rod mill, Morgan continuous rod mill, 411 wire drawing blocks, 370 wire nail machines, 40 wire fence machines, and six galvanizing pots.

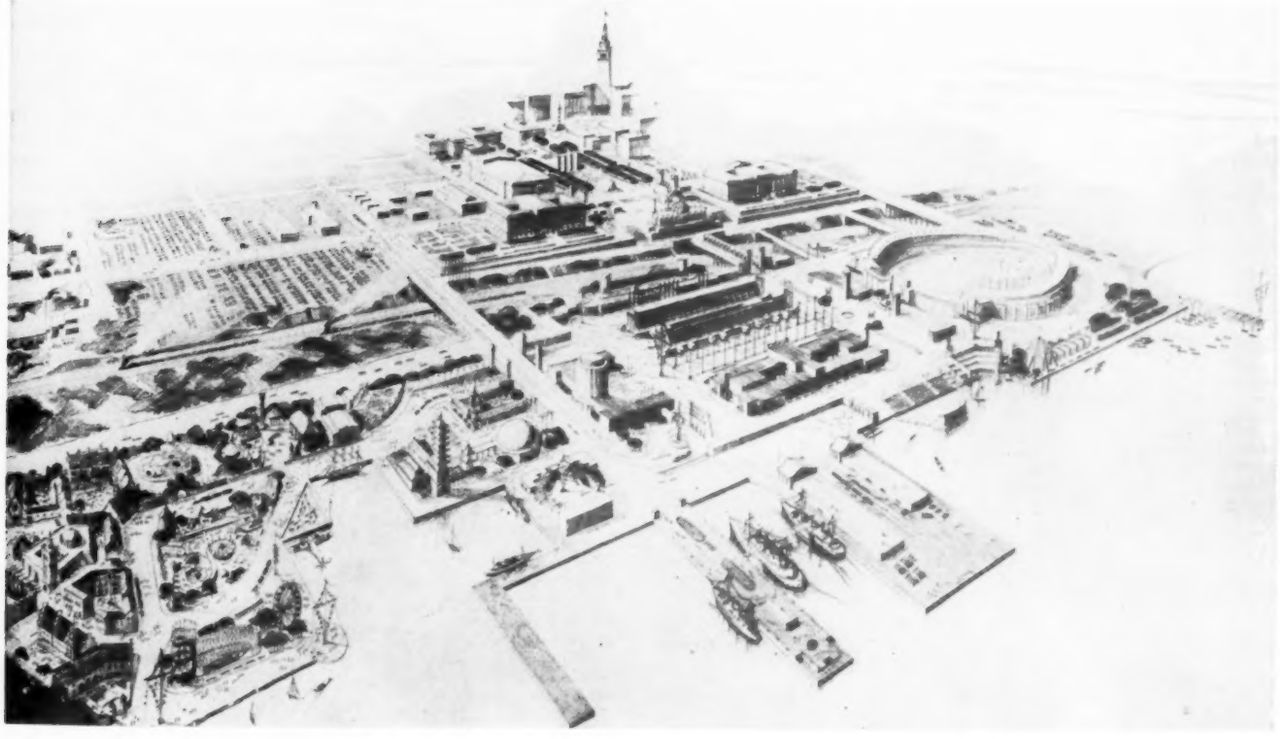
At Allenport it has four seamless tube mills with yearly capacity of 240,000 tons of pipe, oil country tubing and boiler tubes; at Glassport, hoop, band, and cotton tie mills; and at Alicia 400 coke ovens with yearly capacity of 375,000 tons of coke. It also has important coal mines in western Pennsylvania with capacity of 600,000 tons annually, and possesses important iron ore interests in both the Mesabi and Gogebic ranges in Minnesota and Michigan.

See Roemer as President

A combination of these two steel companies would result in the formation of a concern which would be numbered among the first twelve steelmakers in the United States.

It is believed that Mr. Roemer will head the merger, when completed.

Artist's Sketch of Proposed Great Lakes Exposition in Cleveland



Iron and steel will be the central theme of the exposition to be held on the lakefront in Cleveland during July, August and September. As the region where coal meets iron ore and the greatest steel-consuming area in the world, the lower lake area is being asked to participate. Working exhibits from iron and steel producers and manufacturers of equipment are planned. Headquarters of the Great Lakes Exposition are in the Terminal tower, Cleveland

Largest November Imports Since 1929

IMPORTS of steel and iron products into the United States in November, 1935, were slightly less than in October. The November figures by the metals and minerals division, department of commerce, were 59,473 gross tons for October and 56,637 tons for November, a decrease of 2836 tons. The November total, nevertheless, was the largest, except for October, 1935, since October, 1929, when imports totaled 63,226 gross tons.

Pig iron and scrap accounted for more than half the imports, scrap increasing 4263 tons over October and pig iron decreasing 1618 tons. Barbed wire showed a shrinkage of 1449 tons; nails, tacks and staples 757 tons; pipe, 864 tons; and other items a smaller change.

Most pig iron came from the Netherlands, most manganese ore from the Gold coast, the greater part of the ferromanganese from Canada, and by far the larger part of imports of sheets, skelp, sawplate, structural steel, bars and hoops and bands from Belgium.

For 11 months of 1935, total imports were 416,461 gross tons, compared with 297,082 tons for the same period of 1934, an increase of 40 per cent.

Statistics of steel and iron exports for November were presented in STEEL, Dec. 30, page 10.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,269
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
June	33,208	289,687	24,848	219,406
July	31,894	296,802	17,676	233,186
Aug.	31,312	247,312	32,418	242,947
Sept.	53,158	244,419	23,847	301,330
Oct.	59,569	238,358	20,202	220,209
Nov.	56,637	205,242	35,272	299,263
11 mo.	416,461	2,828,067	297,082	2,549,761
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764

ORIGIN OF NOVEMBER IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Germany	156	10	.....
France	.....	.....	188
Netherlands	9,782	.....	154
Norway	169	.....	1,471
Sweden	260	.....	.....
U. S. S. R.	.....	1,833	.....
United Kingdom	100	.....	194
Brazil	.....	1,804	.....
Chile	.....	28	.....
British India	3,845	4,975	.....
Gold Coast	.....	6,092	.....
Canada	1,188	.....	6,106
Poland	.....	.....	40
Japan	50	.....	.....
Total	15,550	14,742	8,153

	Sheets skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	252	2,567	1,288	873
France	174	1,026	113	529
Germany	98	179	369	145
Sweden	11	.....	263	.....
United Kingdom	5	.....	97	48
Canada	1	.....	1	2
Austria	....	.....	14	.....
Czechoslovakia	....	25	2	.....
	541	3,797	2,147	1,597

Renew Wrought Pipe Code

Division of simplified practice of the bureau of standards has announced that the simplified practice recommendation R57-31, for wrought iron and wrought steel pipe, valves, and fittings, has been reaffirmed without change by the standing committee of the industry.

This simplification program, which is concerned with the nominal inside diameter, outside diameter, and approximate thickness for standard weight, extra strong, and double extra strong wrought iron and wrought steel pipe, was revised in 1932.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Nov., 1935	Oct., 1935	Jan. thru Nov., 1935
Pig iron	15,550	17,168	114,648
Sponge iron	195	123	1,284
Ferromanganese and spiegeleisen (1)	8,153	6,540	49,821
Ferrochrome (2)	10	.....	11
Ferrosilicon (3)	78	34	772
Other ferroalloys (4)	.....	.....	1
Scrap	15,392	11,129	53,763
St'l ingots, blooms, etc.	83	361	2,045
Concrete bars	166	76	2,746
Hollow bar, drill steel	88	141	1,089
Merchant steel bars	.....	.....	8,439
Bars, solid or hollow (6)	2,147	2,448	13,725
Iron slabs	.....	.....	.....
Iron bars	56	158	1,470
Wire rods	2,612	2,475	15,494
Boiler and other plate	54	3	541
Sheets, skelp, saw plate	541	1,939	10,002
Tin plate	8	18	182
Structural shapes	3,828	4,265	35,983
Sheet piling	.....	225	225
Rails and fastenings	762	1,118	4,955
Cast-iron pipe, fittings	46	3	76
Malleable iron pipe fittings, advanced	.....	.....	46
Welded pipe	596	678	4,253
Other pipe	431	1,295	14,110
Cotton ties (5)	.....	825	8,136
Other hoops and bands	1,597	1,741	20,306
Barbed wire	1,486	2,935	22,720
Round iron, steel wire	253	367	3,587
Telegraph and telephone wire	15	2	38
Flat wire, strip steel	204	214	1,696
Wire rope and strand	281	178	1,863
Other wire	120	212	1,215
Nails, tacks, staples	1,883	2,640	19,205
Bolts, nuts, rivets	35	6	274
Horse and mule shoes	43	18	552
Castings and forgings	124	128	1,188
	56,637	59,473	416,461

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class. No comparable figures for 1934 or previous years.
(6) New classification as result of the Reciprocal Trade Agreement with Belgium. No comparable figures for previous year.

Production

STEELMAKING climbed 2 points last week to 51½ per cent, recovering in part the losses sustained in the last week of December and the first week of this year. Further improvement is looked for this week, as tentative plans at Chicago, Youngstown, Pittsburgh and New England indicate slightly heavier schedules. All major districts registered increases last week, with the exception of Youngstown, which held firm. Further details follow:

Pittsburgh—Advanced 2 points to 40 per cent last week, with a slight rise expected this week. Twenty-seven out of 61 blast furnaces are active, up one. Weirton Steel Co. last Friday resumed partial operations at its Steubenville, O., plant which had been closed for the past five months to allow for modernization, including electrication of machinery. This plant, which is devoted exclusively to production of tin plate, is expected to run at full capacity within ten days.

Chicago—Increased 4½ points to an average of 51½ per cent. A large portion of the gain was accounted for by the resumption of eight open-hearth furnaces by Inland Steel Co., following the completion of a mill improvement program. A further gain this week is indicated, since last week closed with a 54 per cent schedule for the district. Blast furnace operations are unchanged, 20 of 41 stacks being active.

Wheeling—Off 2 points to 68 per cent, with 25 out of 37 open-hearth furnaces in operation.

New England—Up 8 points to 83 per cent, with indications pointing toward a 93 per cent rate this week.

Birmingham—Dropped 15 points to 41 per cent last week, with nine open hearths active. The rail mill of the Tennessee Coal, Iron & Railroad Co., now idle, is expected to resume on or about Feb. 1.

Detroit—Unchanged at 88 per

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Jan. 11	Change	Same week 1935	Same week 1934
Pittsburgh	40	+ 2	27	21
Chicago	51½	+ 4½	49	32
Eastern Pa.	35½	+ 1½	26	21½
Youngstown	62	None	56	26
Wheeling	68	— 2	84	62
Cleveland	60	—12	82	54
Buffalo	50	None	39	29
Birmingham	41	—15	33½	52
New England	83	+ 8	68	88
Detroit	88	None	59	79
Average	51½	+ 2	45½	30

cent, with 15 out of 17 furnaces on schedule.

Buffalo—Held at 50 per cent last week, but the rate is expected to drop 3 points to 47 per cent this week as one open hearth is taken off. However, there is a possibility this furnace will not be out long and no further decrease is expected.

Central eastern seaboard—Up 1½ points to 35½ per cent last week, with production expected to be sustained at least this week.

Cleveland-Lorain—Down 12 points to 60 per cent. Republic Steel Corp. operated nine open hearths until the middle of the week and then went down to six. Otis Steel Co. increased from seven to eight in midweek. At Lorain, National Tube Co. operated eight. Republic is operating three blast furnaces; Otis and National Tube, each two. Cleveland sheet and strip mills operated last week at capacity.

Youngstown—Unchanged at 62 per cent last week, with a slight gain to 63 per cent expected at this week's start on the basis of tentative schedules.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1935	1934	1933	1932
Jan.	534,055	331,777	285,138	426,271
Feb.	583,137	385,500	275,929	413,001
March	668,056	588,209	256,793	388,579
April	591,728	643,009	335,321	395,091
May	598,915	745,063	455,302	338,202
June	578,108	985,337	603,937	324,746
July	547,794	369,938	701,322	272,448
Aug.	624,497	378,023	668,155	291,688
Sept.	614,933	370,306	575,161	316,019
Oct.	686,741	343,962	572,897	310,007
Nov.	681,820	366,119	430,358	275,594
Dec.	661,515	418,630	600,639	227,576
Yrl. adj.	19,907	44,283		5,160
Total	7,371,299	5,905,966	5,805,235	3,974,062

DECEMBER SHIPMENTS OFF; 1935 TOTAL EXCEEDS 1934

Shipments of finished steel by the United States Steel Corp. in December were 661,515 tons, a decline of 20,305 tons from the 681,820 tons shipped in November. However, total shipments for 1935, exclusive of the year-end adjustment, were 7,371,299 tons, compared with 5,905,966 tons for all of 1934, after year-end adjustment, and 5,925,873 tons before adjustment.

NEW BETHLEHEM MILL IN

Commercial operation of the Bethlehem Steel Co.'s new wide continuous sheet-strip mill at Lackawanna (Buffalo) N. Y., was started New Year week. The cold rolling mill is expected to be in operation in about six weeks. The Seneca unit of Bethlehem continues to operate at about 90 per cent of capacity.

COLORADO REOPENS IRON MINE

Colorado Fuel & Iron Co., Denver, reopened its iron ore mine at Sunrise, Wyo., in December.

A New "Tie That Binds"

REPUBLIC STEEL CORP. last week booked an order for stainless steel sufficient to make 350,000 wedding rings, which will be sold in Italy to replace gold ones turned in to the government to support the Ethiopian war. According to T. M. Girdler, chairman and president of Republic, the company hopes that the trade name "Enduro" will mean just that for the marriages it evidences.

Names Representative

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has appointed the Markham Supply Co., 310 South Michigan avenue, Chicago, its general railway sales representative in the Chicago, St. Louis, Kansas City, Mo., Omaha, Nebr., and Twin Cities territory. Lloyd R. Wells, formerly railway sales representative of Babcock & Wilcox, will continue in the same capacity with the Markham company.

1935 Ingots Show 30.6 Per Cent Gain

PRODUCTION of steel ingots in 1935 increased 30.6 per cent over the total for 1934, according to the American Iron and Steel institute. Total calculated output for 1935 was 33,425,576 tons, compared with 25,599,118 gross tons in 1934, an increase of 7,826,458 tons. The average daily rate for 1935 was 107,478 gross tons; in 1934 it was 82,312 tons, a gain of 25,166 tons.

Total output for 1935 is the largest since 1930, when the production was 39,286,287 gross tons.

December, 1935, attained an average daily rate of 123,272 tons, compared with 121,279 tons in November, the total output for December being 3,081,807 tons and for November, 3,153,247 tons. December had one less working day than November. The daily rate for December was the best since May, 1934, when it was 125,907 tons. Except for that month and July, 1933, with an average of 126,734 tons, December, 1935, showed the best rate since June, 1930.

December showed the sixth consecutive rise in the rate of production, a consistent gain having started in July after a fairly regular decline from the relatively high point in February.

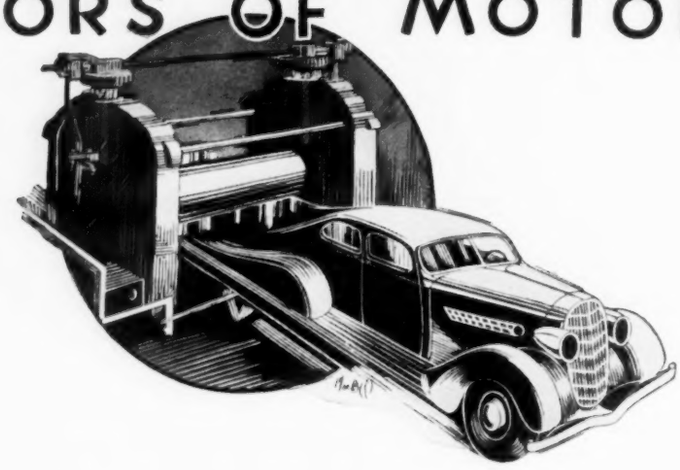
Steel Ingot Production

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 97.91 per cent

	Open Hearth		Bessemer		Total		Calculated daily production, all companies	Number of working days
	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	Gross tons	Per cent of capacity	(gross tons)	
1935								
Jan.	2,631,673	49.73	239,858	34.99	2,871,531	48.04	106,353	27
Feb.	2,553,429	54.28	224,336	36.82	2,777,765	52.28	115,740	24
Mar.	2,637,331	51.75	230,810	34.97	2,868,141	49.83	110,313	26
Apr.	2,408,588	47.27	231,916	35.14	2,640,504	45.87	101,558	26
May	2,381,061	44.99	254,796	37.17	2,635,857	44.10	97,624	27
June	2,020,406	41.23	210,487	33.17	2,230,893	40.31	89,236	25
July	2,045,768	40.15	224,456	34.01	2,270,224	39.44	87,316	26
Aug.	2,685,965	50.76	233,361	34.05	2,919,326	48.84	108,123	27
Sept.	2,596,098	52.98	233,737	36.83	2,829,835	51.13	113,193	25
Oct.	2,875,727	54.34	270,719	39.50	3,146,446	52.64	116,535	27
Nov.	2,901,084	56.93	252,163	38.20	3,153,247	54.78	121,279	26
Dec.	2,833,382	58.23	228,425	35.99	3,081,807	55.68	123,272	25
Total	30,590,512	50.19	2,835,064	35.91	33,425,576	48.55	107,478	311
1934								
Jan.	1,824,640	34.69	172,489	25.17	1,997,129	33.59	73,968	27
Feb.	2,036,071	43.55	175,873	28.87	2,211,944	41.86	92,164	24
Mar.	2,594,536	49.33	203,904	29.75	2,798,440	47.07	103,646	27
Apr.	2,678,582	55.00	257,482	40.57	2,936,064	53.34	117,443	25
May	3,067,874	58.33	331,620	48.38	3,399,494	57.18	125,907	27
June	2,776,891	54.83	282,592	42.81	3,059,483	53.44	117,672	26
July	1,369,584	28.12	119,869	18.89	1,489,453	27.06	59,578	25
Aug.	1,271,752	24.18	109,598	15.99	1,381,350	23.24	51,161	27
Sept.	1,151,362	23.64	117,615	18.53	1,268,977	23.05	50,759	25
Oct.	1,354,113	25.75	127,789	18.64	1,481,902	24.93	54,885	27
Nov.	1,478,566	29.19	132,059	20.01	1,610,625	28.13	61,947	26
Dec.	1,832,790	37.63	131,467	20.72	1,964,257	35.68	78,570	25
Total	23,436,761	38.68	2,162,357	27.39	25,599,118	37.38	82,312	311

Capacity percentages for 1935 are based upon open-hearth capacity of 60,954,717 tons and bessemer of 7,895,000 tons on Dec. 31, 1934; for 1934 based on open-hearth capacity of 60,583,813 tons and bessemer of 7,895,000 tons on Dec. 31, 1933

MIRRORS OF MOTORDOM



DETROIT

EVEN more than the rest of the country, Detroit is eager to ascertain the reaction to the Supreme Court decision invalidating the AAA and the future plans of the Roosevelt administration in regard to agriculture, because the buying power of approximately 25 per cent of the automobile market hangs in the balance.

After conceding that it still is too early for balanced judgment, the majority opinion in Detroit at this time is as follows:

Most income from 1935 crops was in the pockets of farmers in the closing 60 days of the year. The larger automobile shows are not held at points calculated to attract rural buyers in great numbers, but the advanced showing of 1936 models in November enabled dealers selling the country trade to stock new cars and to canvass their prospects before the end of the year.

May Affect Time Payments

Thus, it is quite possible that the decision to introduce new models last November was genuinely propitious, and most of the automobile buying, likely to be based upon 1935 crop income, may already have been done.

This, however, leaves a tag end in that a cessation of "the gentle rain of AAA checks" might menace installment buyers, but there is an offset in the fact that the proportion of installment sales to cash sales is less in suburban than in urban areas.

Also, the government is likely to carry out its moral obligation to farmers and honor its pledges, hence the Supreme Court decision may not have cut off sharply all payments to farmers.

An analysis of 1935 sales is not available, but a comparison of 1934 registrations with 1933 indicates the greater comeback in automobile sales in rural communities than in cities, due in large measure to federal disbursements. In Idaho, new passenger car registrations increased over 100 per cent. In Montana, Nevada, Wyoming, Colorado, New Mexico, and Arizona the increase was 51 per cent to 100 per cent.

In North and South Dakota, Kansas, Texas, Iowa, Wisconsin, South Carolina, Utah, Nebraska, Oregon, Washington, Arkansas, Louisiana, Georgia, Virginia and Mississippi the increase was 31 to 50 per cent. The states here enumerated are predominantly agricultural. The remaining states—predominantly industrial for the most part—showed smaller gains.

This also is almost entirely conjecture, but the best minds in Detroit are thinking that the recovery of general business which set in following the termination of NRA last May will be duplicated, provided of course the new deal does not attempt in some devious manner again to regiment agriculture.

While severely critical of the new deal on the principles involved, the automotive industry tempers its outraged feelings with the consolation that, after all, both NRA and AAA may have served a purpose. Both were thrown into the breach at a time when general morale was low, they heartened certain elements in the population with the assurance that at least the government was trying to do something for them, and now that both of these programs have been declared unconstitutional, they can be accepted as signs of the times.

Production Peak in April

Referring again to the general improvement in business which appeared to follow the dissolution of NRA late in May, it is interesting to note that the automobile industry had achieved the peak of 1935 sales just prior to the decision.

January production of 292,817 units was followed by 335,700 in February, 429,834 in March, and 477,746 in April. May saw a sharp slump to 364,727, June was about stationary at 361,321, then followed a decline to the year's low in September, just prior to the changeover to new models. Both November and December were practically 400,000-car months, due of course to the November shows.

There is some belief in Detroit that the certain passage of the soldiers' bonus bill will provide a lift for the spring market and at least supply an offset to any defection in rural sales.

Output Falling Slowly

All the foregoing, of course, is conjecture. The hard-headed production managers see the following as the immediate situation. January assemblies of passenger cars and trucks will be at least 10 to 15 per cent below December, or a little below 350,000 units. February production will fall below 300,000 units. A turn upward will come in March.

This by no means indicates a retreat from high expectations for 1936, but it is a realistic viewpoint following the seasonally high production of November and December. It is substantiated by a slower rate of releases for steel, pig iron, and parts, and by smaller offerings of scrap by automotive plants. The weakness will become more apparent as January wears on.

SPEAKING of the bonus, automotive planning divisions in Detroit have been trying to figure whether used or new cars will bulk the largest in whatever automobile purchases are financed by it.

After making allowances for loans and interest, bonus payments under $600 are expected to be more numerous than those over this figure. Since money that comes from Santa Claus is spent with more abandon than that which must be laboriously saved, the best guesses are that new rather than used cars will benefit, and that most bonus checks cashed by automobile dealers will be for down payments.

However, there will be an opportunity for the smart dealer to push

used cars in special campaigns, and the bonus billions might be put to work rectifying the situation that is distressing to all automobile manufacturers.

Chevrolet is approaching this situation realistically with its offer of $20 to each dealer for every old car taken in for junking this month. Chevrolet is also paying salesmen $5 for each used car sold in excess of his January, 1935, sales, the dealer to match this $5.

Unlike the Ford scrapping plan, also based on a $20 payment, Chevrolet will do the junking indirectly. District managers will take the cars off dealers hands and route them to local scrap yards.

See 20,000 Cars Junked

While Chevrolet has set up $1,000,000 for its used car disposal program, it expects direct payments this month to total $400,000, adequate to retire 20,000 cars. Since Chevrolet has 9800 dealers, this is an average of slightly more than two cars per dealer—not high.

Secretly, Chevrolet is rather hopeful that its competitors will join with it in this program. Ford has about 10,000 dealers and Plymouth 7000—making a total for of about 27,000 dealers for the low-price field. Altogether, there are about 36,000 dealers in the country. An average of only three scrappings per dealer per month would take 100,000 wrecks off the road in 30 days.

Ford's car scrapping program, adopted early in 1930, also was predicated upon a payment of $20 per car, but was abandoned when Ford realized that he single-handed was doing a job for the entire industry. Ford specified that each car must have a battery and some semblance of tires. Chevrolet is scrutinizing each derelict to make certain that it is not bidding up the market.

IN REGARD to used cars, Hudson-Terraplane has been analyzing the age of trade-ins since it brought out its 1936 models, and has found that 14.2 per cent are 1935 models, 29.1 are 1934 models, and 16.1 are 1933 models—a total of 59.4 per cent being one to three years old.

Breaking down the remainder of its trade-ins, Hudson-Terraplane finds 9.1 per cent are 1932, 8.3 are 1931, 7.0 are 1930, 10.3 are 1929, and 5.5 are prior to 1929. The remaining 0.4 per cent of trade-ins are 1936 models.

Merely to state the facts and not to make any invidious comparisons, Hudson-Terraplane dealers are chiefly taking in 1935 Olds, Dodges and Fords, 1934 Chevrolets, Fords, Dodges, Olds, Pontiacs and Plymouths, and 1931 and 1929 Buicks.

Another breakdown is this. Trade-ins on new Terraplanes are 50.8 per cent Hudson products—35.0 per cent Terraplane, 10.8 per cent Essex, and 5.0 per cent Hudson. In other words, loyalty accounts for slightly over one-half of all Terraplane sales.

Of the remainder, 12.5 per cent is sold to former Chevrolet owners, 11.7 per cent to Ford owners, 7.0 per cent to Plymouth owners, 2.2 per cent to Buick owners, with a scattering for other makes.

Hudsons also command marked loyalty, 63.0 per cent of the sales being repeat ones as follows—46.2 per cent to Hudson owners, 14.1 per cent to Terraplane owners, and 2.7 per cent to Essex owners.

Electric Gearshift on Half

An idea of the optional equipment which is being purchased by Hudson-Terraplane owners may be gained from the following percentages—trunks in 48.1 per cent of sales; electric hand, 50.4 per cent; radio installed at the factory, 15.2 per cent; air horns, 17.5 per cent; special steering wheel, 14.6 per cent; wheel disks, 17.7 per cent. The latter three items, it should be noted, include standard equipment on Hudson eight custom models. If radios installed locally as accessories are included, 21.7 per cent of all cars are thus equipped.

Here is how colors are running this year: Black, 27.5 per cent; tuscan tan, 14.2 per cent; Montana green, 11.7 per cent; glacier blue, 9.9 per cent; vineyard green, 8.9 per cent; Hudson blue, 7.9 per cent. Optional colors account for the remaining 19.9 per cent, almost evenly divided between neptune gray, sage green and pepper tan.

THE recession in production which Detroit generally expects this month is slow. Assemblies last week totaled 98,630, against 54,840 the preceding week and 71,335 in Christmas week. The best week in December saw only 103,600 cars produced. . . . Packard resumed last week, on the basis of 300 units a day. It may purchase dies soon for its proposed low-price six. . . . Ford has snapped back strongly, making 26,980 cars last week, against 12,500 in each of the two preceding weeks.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,321
July	229,357	264,933	337,044
Aug.	232,855	234,811	240,051
Sept.	191,800	170,007	89,805
Oct.	134,683	131,991	275,021
Nov.	60,683	83,482	398,024
Dec.	80,565	153,624	*385,000
Year	1,920,057	2,753,111	*3,987,000

*Estimated

Estimated by *Cram's Reports*

Week ended:

Jan. 4	65,840
Jan. 11	98,630

Convention Calendar

Jan. 21-23—Institute of Scrap Iron and Steel Inc. Eighth annual convention at Hotel Sherman, Chicago. Benjamin Schwartz, 11 West Forty-second street, New York, is director general.

Jan. 20-24—American Road Builders' association. Annual convention and national road show at Public Auditorium, Cleveland. Charles M. Upham, 914 National Press building, Washington, is managing director.

Jan. 27-31—American Society of Heating and Ventilating Engineers. Annual convention at Palmer House and exposition at International Amphitheatre, Chicago. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

Feb. 3-7—National Electrical Manufacturers' association. Midwinter convention at Waldorf-Astoria hotel, New York. W. J. Donald, 155 East Forty-fourth street, New York, is managing director.

Feb. 17-21—American Institute of Mining and Metallurgical Engineers. 145th annual meeting at Engineering Societies building, New York. John T. Breunich, 29 West Thirty-ninth street, New York, is assistant secretary.

Feb. 25-27—American Concrete Institute. Annual convention and exhibit at Palmer House, Chicago. Harvey Whipple, 642 New Center building, Detroit, is secretary.

March 2-6—American Society for Testing Materials. Spring group meeting of committees at William Penn hotel, Pittsburgh. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

March 3-6—American Management association. Sixth packaging conference and exposition at Hotel Pennsylvania, New York. Alvin E. Dodd, 20 Vesey street, New York, is executive vice president.

March 4—American Society for Testing Materials. Regional meeting at William Penn hotel, Pittsburgh. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

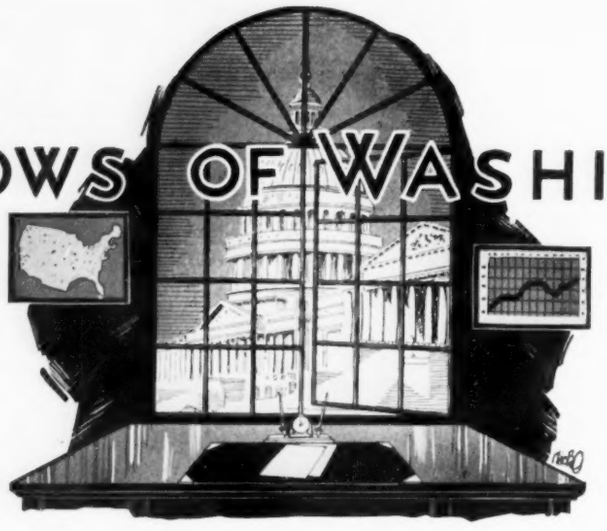
March 18-20—National Association of Waste Material Dealers Inc. Annual convention at Hotel Astor, New York. Charles M. Haskins, 1109 Times building, New York, is secretary.

March 29-April 4—American Ceramic society. Annual convention and exhibit at Columbus, O. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

April 16-17—American Institute of Mining and Metallurgical Engineers. Meeting of open-hearth committee in Detroit. L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., is chairman.

April 20-24—Sixth Midwest Power Engineering conference, in Chicago. G. E. Pfisterer, 308 West Washington street, Chicago, is secretary.

WINDOWS OF WASHINGTON



WASHINGTON

THE Washington 3-ring circus—executive, judicial, and legislative—has got away to a flying start. First came the President's message to congress on the "state of the nation" so-called; second was the Supreme Court's blast terminating AAA; now congress is milling around, champing at the bit but unable yet to determine just what is the politic thing to do in view of the approaching election.

Reactions are still incomplete on the Supreme Court's decision finding the AAA unconstitutional and while both President Roosevelt and Secretary of Agriculture Wallace stated definitely to the press some weeks ago that it made no difference what the court said about the AAA that they had substitutes ready, these have not yet appeared.

It appears that the court again took the administration off its guard just as when on May 27 it Schechtered the NRA. Those in close touch with trends have believed all along that the court would do just what it did, although admittedly they were not expecting such a drastic decision.

Opinion Is Divided

At this time it is rather hard to interpret the decision in relation to the steel industry. There are those here who believe that it will cut down the buying power of the farmers for machinery and automobiles; there are others who believe that with restrictions off, agriculture will snap back as industry did after the NRA decision.

Many feel that business is on the upward trend, and it will be impossible for the AAA decision to stop it. Again, opinion has been expressed that the bonus, which undoubtedly will soon become law, wil take care of additional spending money to the tune of some billion and a half dollars and while the farmers might buy fewer automobiles in the near future the veterans will use some of their money for this purpose.

Now that the first effects of the decision have been recorded, there is a feeling among members of congress and government officials that the whole situation will be handled without unduly dislocating business.

Secretary of Commerce Roper, at his press conference last week, said that he could not tell what effect the decision would have on foreign trade but he did express the opinion that "some control is necessary." Also, he said, "we are going forward in spite of the decision and methods of meeting the emergencies will be found."

Washington correspondents at their conference with the President last week made every effort to smoke him out on his attitude toward the AAA decision, but probably remembering his "horse and buggy" break on the NRA decision, he kept his peace. His only comment was the fact that the administration is working on some substitute for three A's. He did say, of course, that the government will take care of its "moral" obligations to the farmers on contracts which are in effect.

In the meantime, the President sent to congress last week his budget message in which he lopped a cool billion off his previous year's recommendations. However, the whole estimate is now up in the air, what with the AAA decision necessitating new monetary supplies, and the coming bonus payment. It is still the contention of the administration that it will probably not have to ask for new tax legislation at this session.

BIG INDUSTRIES ALOOF AS BERRY HOLDS CONFERENCE

Maj. George L. Berry had his meeting last week of his so-called council for industrial progress. The iron and steel, automobile, lumber, electrical, paper, and other leading industries were not represented.

There are said to have been 120 at the council meeting, including 30 representatives of labor, and the remainder representatives of small industries.

The net result of the meeting was the appointment of seven committees to discuss seven questions. They are to be composed of three representatives of management, three of labor, and one from a consumers group. They were appointed by Major Berry.

The questions to be considered by the committees include national industrial policy; maximum work week, general wages and child labor; fair trade practices; competition, both internal and external affecting American standards; government competition with private enterprise; anti-trust laws, including the federal trade commission act and their effect on industry; and financial aid to small enterprises.

J. P. Frey, head of the metal trades division of the A. F. of L., attended the conference. E. B. Abbett, president of the National Corrugated Rolled Metal Culvert Pipe association, and George Alcock, secretary of the Locomotive institute, also attended.

Await Neutrality Bills

Bills have been introduced in both houses of congress to straighten out the neutrality situation. Not only administration but several other bills have been introduced, but the general feeling is that the administration will have its way. Most bills take up particularly the matter of placing commodities on an embargo list.

It will be recalled that the administration was hard pressed recently to embargo iron and steel scrap and similar commodities to Italy and Ethiopia. It was felt that this could not be done under the present limited law.

It is expressly provided in the new bills, however, that such embargoes can be enforced if they become law, and exports of more than "normal"

amounts of war material would be prohibited.

Government officials refuse to say just what they would call a "normal" year for shipments of iron and steel scrap to Italy. However, the figures speak for themselves. Shipments in 1935 averaged close to 40,000 tons monthly. In 1934 exports were 225,644 tons; in 1933, 114,419 tons; 1932, 6678 tons; 1931, 2176 tons; 1930, 32,434 tons; and 1929, 92,377 tons. The average is about 135,000 tons a year.

Senator Pittman, who introduced the neutrality bill in the upper house for the President, stated:

"Embargo against the exports of arms, ammunitions, and implements of war and other article and materials in excess of normal exports to belligerents, is mandatory and permanent in the new bill. It is also mandatory to extend such embargoes to other countries as and when they become belligerents. This was the intent of the former act, although in the former act the word 'may' was used. In the present act the word 'shall' is used."

NO PHILIPPINE CHROMIUM CAN BE SHIPPED TO ITALY

State department officials say that the question of shipments of chromium from Philippine islands to Italy is a closed incident insofar as they have ruled that such shipments would be contrary to the policy of the United States government.

Under the independence law, during the coming 10-year period all foreign relations of the Philippine islands are handled through Washington.

Ruling was asked on the shipment by the Philippine government through High Commissioner Frank Murphy, at Manila. He asked Washington officials whether the American neutrality policy would be violated if companies operating chromium mines in the Philippines filled an order which they had received from Italy.

EXPECT REPORT THAT STEEL MAINTAINS NRA STANDARDS

The so-called Roberts NRA report has been completed and only awaits the signature of several members of the committee before it is sent either to Secretary of Commerce Roper or to President Roosevelt.

It has not yet been determined whether the report will be made public. This report should not be confused with the industry studies which are being made by NRA.

Back in June, the President asked NRA to make a report on hour and wage and trade practice compliance since the official ending of NRA through the Supreme Court decision.

While nothing at all official has been made public, it is said that the report shows that there has been 100 per cent compliance in the steel industry insofar as hours and wages are concerned.

Of course, a statement like that would not be much to the liking of the administration — especially in view of the fact that the President has tried all along to make the public believe that there has been lack of hour and wage compliance in the large industries since NRA passed out.

TECHNOLOGICAL PROGRESS HARD ON LABOR, SAYS GREEN

In a statement last week, President William Green of the American Federation of Labor, talking on unemployment, said that "it is significant that, although business has now recovered half of its depression loss, only 30 per cent of the depression unemployment has been put to work.

"This is due to the fact," he continued, "that, while technological improvements in industry are steadily reducing the number of workers necessary to provide all the goods and services industry can market, the number of men and women who want work is steadily increasing.

"Since 1929, 4,000,000 persons have been added to the army of job seekers but, in manufacturing industries alone, production per man per hour has increased 25 per cent, making it possible to turn out the 1929 volume of product with 1,800,000 fewer workers, if plants operate at 1929 work hours. Similar improvements have reduced the number of jobs available in other industries."

Died:

WILLARD N. SAWYER, 73, former president Wellman-Seaver-Morgan Co., now the Wellman Engineering Co., Cleveland, at Kent, O., Jan. 5. Starting his industrial career at the Bellaire Iron Works and the Homestead works of the Carnegie Steel Co., Mr. Sawyer joined the Wellman-Seaver Engineering Co. about 1900. He was engineer of construction for the open-hearth steel plant of the Alabama Steel & Shipbuilding Co., at Ensley, Ala., now a part of the United States Steel Corp.

In 1904 he left the company, then the Wellman-Seaver-Morgan Co., to become general manager of the Algoma Steel Corp. and the Lake Superior Corp., Sault Ste. Marie, Ont. He rejoined the Wellman-Seaver-Morgan Co. Dec. 5, 1906, as general manager, and was elected president Feb. 19, 1907. He held this post until illness forced his resignation Feb. 20, 1917. He was a protegee of the late S. T. Wellman, and in his school days was noted as a baseball player.

♦ ♦ ♦

Percy Carlyle Gilchrist, 83, vice president of the Iron and Steel institute of Great Britain, London, England, Dec. 17. He was one of the founders of the basic, or Thomas-Gilchrist, process for making steel from phosphorous pig iron.

♦ ♦ ♦

William C. Hulshizer, president, Harold McCalla Co., iron and steel jobber, Philadelphia, in Philadelphia, Dec. 19.

♦ ♦ ♦

Harry Le Van Horning, 55, one of the founders of the Waukesha Motor Co., Waukesha, Wis., and president since 1925, in Battle Creek, Mich., Jan. 4. He gained international renown in automotive power plant design, and in 1925 was president of the Society of Automotive Engineers.

♦ ♦ ♦

Albert C. Nieman, 55, Detroit sales engineer, Gisholt Machine Co., Madison, Wis., in Detroit recently. He was born in Madison and joined the Gisholt company in 1908. Before gong to Detroit in 1928, he represented the company in Berlin, Germany; Elizabeth, N. J.; Syracuse, N. Y.; Cleveland, and Milwaukee.

♦ ♦ ♦

Capt. Siegfried Roebling, 45, vice president of John A. Roebling's Sons Co., steel cable manufacturer, Trenton, N. J., in Los Angeles, Jan. 1. He had been identified with the wire mills founded by his great-grandfather, since his youth. He served in the World war and subsequently commanded Company G, 114th infantry, New Jersey national guard.

♦ ♦ ♦

John B. Singer, 64, for the past 26 years superintendent of the Algoma Steel Corp.'s roll department, Sault Ste. Marie, Ont., and a veteran of 45 years' experience in roll turning, in that city Dec. 26. Born in Gloucester, Mass., Mr. Singer started at the age of 19 in the roll shop of the Pennsylvania Steel Co., now Bethlehem Steel Co., at Steelton, Pa. He remained there until 1909, when he went to the Soo, succeeding William Craig as superintendent of the roll department of the Algoma corporation.

♦ ♦ ♦

Arthur Willis Walker, 75, for many years president Walker & Pratt Mfg. Co., Watertown, Mass., in Malden, Mass., Jan. 4. Upon graduation from Massachusetts Institute of Technology in 1882, he joined the company of which his father was president. He occupied various positions of responsibility and was elected president in 1901, a position he retained up to the time of his death. Mr. Walker was one of the organizers of the American Foundrymen's association. He served as New England district vice president in 1899, and as president of the association in 1902.

Men of Industry

THREE new vice presidents have been created by the United States Steel Corp.—Harold L. Hughes, with executive duties assigned by the president; W. A. Forbes, with supervision over by-product coke plants and disposition of their products, and Charles H. Rhodes, with general supervision over purchases. The appointments are effective at once.

Mr. Hughes was graduated from Harvard university in 1900, summa cum laude, and later served as an instructor in chemistry there. He became associated with a Steel corporation subsidiary in the capacity of

Harold L. Hughes

draftsman in 1901, and later worked his way up through the sales departments of several subsidiaries. In 1917 he became affiliated with the president's office in New York, and in 1928 was made assistant to the president.

Mr. Forbes joined the organization as chemist at the Homestead works of the Carnegie Steel Co. in 1895. From 1900 to 1907 he held the positions of assistant chemist, chief chemist, and superintendent in charge of blast furnaces, with National Tube Co. at McKeesport, Pa., and in 1908 went to New York to handle sales of all coke by-products of Corporation subsidiaries.

Mr. Rhodes spent the early period of his industrial career at Pittsburgh, where he was identified with the purchasing department of the American Steel & Wire Co. from 1899 to 1917. In the latter year he left to become purchasing agent for the Canadian Steel Corp., Ojibway, Ont. He later went to Chicago as purchasing agent for the Illinois Steel Co., and in 1934 was made assistant general manager of sales, in charge of sales of bars, strip and alloy steels. Early in 1935 he was appointed director of purchases for the Steel corporation, with offices in New York.

♦ ♦ ♦

William J. Filbert, who retired Jan. 1 as chairman of the finance committee of the United States Steel Corp., New York, was tendered a testimonial dinner by Myron C. Taylor, chairman of the board of directors, on behalf of the directors and executive officers of the Steel corporation at the Waldorf-Astoria hotel, Jan. 7. Guests included directors of the American Iron and Steel Institute, some ex-officials of the Steel corporation, and personal friends of Mr. Filbert.

With Mr. Taylor presiding, the speakers were J. P. Morgan, Charles M. Schwab, James A. Farrell, Henry G. Dalton, Eugene J. Buffington, Eugene G. Grace, William A. Irvin, Edward R. Stettinius Jr., and Mr. Filbert. Mr. Stettinius, on behalf of his associates, presented Mr. Filbert with a silver service set. There were approximately 125 guests.

♦ ♦ ♦

Dr. John Johnston, director of research of the United States Steel Corp., New York, has been appointed to the alloys of iron research committee of the Engineering Foundation, New York, to represent the American Iron and Steel institute. Other new members of the committee include Wilfred Sykes, a director of Inland Steel Co., Chicago, who has been named to succeed the late Dr. John A. Mathews, and James T. Mackenzie, metallurgist and chief chemist of the American Cast Iron Pipe Co., Birmingham, Ala., who takes the place of R. E. Kennedy, technical secretary of the American Foundrymen's association. The committee is carrying on world research, embracing all forms of steel and iron and their alloys.

W. A. Forbes

♦ ♦ ♦

John S. Andrews, formerly general manager of sales, has been made vice president in charge of sales, Rotary Electric Steel Co., (Michigan) Detroit, effective at once.

♦ ♦ ♦

Jesse R. Harlan, who has been associated with the materials handling equipment industry for more than

Charles H. Rhodes

15 years, beginning his career as advertising manager of the Stuebing-Cowan Co., Cincinnati, has been appointed sales promotion manager of the Yale & Towne Mfg. Co., Philadelphia. Shortly after the Cowan Truck Co. was merged with the Stuebing Co., in 1926, he was sent to Holyoke, Mass., where he handled sales and advertising there for the Cowan division. In 1929 the Stuebing-Cowan Co. was absorbed by the Yale company, and a year later Mr. Harlan established himself in the advertising agency business in Cincinnati. He has been active in the work of the Cincinnati Industrial Marketers association and is a past president of that group. He is also a former director of the National Industrial Advertisers association. His headquarters will be at Philadelphia.

♦ ♦ ♦

Stanley A. Richardson has been appointed general sales engineer of Empire Sheet & Tin Plate Co., Mans-

field, O. For the past five years he has served as chief metallurgist.

After completing his technical training at both the University of Minnesota and the University of Chicago, Mr. Richardson entered the steel industry, and during the past 19 years has served that industry in both technical and executive position. Prior to going with Empire he was with Republic Steel Corp., having held the position of chief metallurgist of Interstate Iron & Steel Co. at the time that firm was merged into Republic.

Mr. Richardson is a member of the Society of American Military Engineers, American Institute of Mining and Metallurgical Engineers, American Society for Metals, and others.

William Fox, a graduate of Carnegie Institute of Technology, and chief chemist of Empire for 15 years, has been appointed chief metallurgist, succeeding Mr. Richardson.

♦ ♦ ♦

W. T. Montague, formerly in charge of the refractories division of Norton Co., Worcester, Mass., has been named manager of sales planning and development.

♦ ♦ ♦

Dr. A. A. Potter, dean of schools of engineering, Purdue university, Lafayette, Ind., has been unanimously nominated as president of American Engineering council for 1936-37 to succeed J. F. Coleman, of New Orleans. Dean Potter will take office at the annual meeting of the council to be held Jan. 9-11 when representatives of national, state, and local engineering societies will convene in Washington.

Stanley A. Richardson

♦ ♦ ♦

Thomas N. Armstrong Jr., has been added to the technical staff of the International Nickel Co. Inc., New York. He will handle steel castings development for the company and will operate out of the New York office. His services will be available to industry at large.

Mr. Armstrong is well known in metallurgical circles, as a result of various papers presented before the American Society for Metals, and contributions to the technical press. He was formerly associate metallurgist at the Norfolk navy yard, Portsmouth, Va., and prior to that spent several years with the Andrews Steel Co., Newport, Ky., in open-hearth furnace work. He is a graduate of the University of Kentucky with a degree in metallurgical engineering.

♦ ♦ ♦

D. P. Hess, in charge of foreign operation for Timken Roller Bearing Co., Canton, O., sails for Europe Jan. 15, to spend six or eight weeks with the officials of the foreign companies associated with the Timken organization.

♦ ♦ ♦

Frank W. Curtis has been appointed manager of the Firthite division of the Firth-Sterling Steel Co., McKeesport, Pa. He will be in charge of engineering sales and product development of Firthite sintered carbides and will make his headquarters at McKeesport.

♦ ♦ ♦

John B. Thomas, since 1929 gen-

New Appointees in Charge of Youngstown Sheet & Tube Co.'s Mills

James K. Sutherland

Made general superintendent of the continuous hot strip mill and the blooming and skelp mills, as noted in STEEL for Dec. 23. He started at the old Brier Hill steel plant in 1908, and in 1923, when the plant was purchased by Sheet & Tube, he continued there, becoming superintendent in 1926. In 1927 he was transferred to the Campbell plant as superintendent of the blooming and skelp mill

Jonathan Ingersoll

Named superintendent of blooming and skelp mills, succeeding Mr. Sutherland. He joined the Sheet & Tube company in 1915, after graduation from Case School of Applied Science. After a year in the metallurgical department he went into the blooming mills as a recorder, and has been with the blooming and skelp mills ever since that time

Alfred G. Glossbrenner

Appointed superintendent of the continuous hot strip mill. He joined the company in February, 1935, as assistant superintendent. After attending the University of Wisconsin, he gained his early experience in the steel industry with the American Sheet & Tin Plate Co., and spent five years with the Illinois Steel Co., at South Chicago, before going to Youngstown

eral sales manager and comptroller of Mid-States Steel & Wire Co., Crawfordsville, Ind., has been appointed assistant manager of the wire sales division of Wheeling Steel Corp., with headquarters at the general offices in Wheeling. Prior to his connection with the Mid-States company, Mr. Thomas was with the Keystone Steel & Wire Co., Peoria, Ill.

F. A. McClelland, for the past two years connected with the Cincinnati sales office of Wheeling, has been appointed assistant manager of the tubular sales division, with headquarters in the general offices at Wheeling. Mr. McClelland went with Wheeling in 1933, from a nine-year connection with Clayton Mark & Co., Chicago, where he was assistant sales manager.

♦ ♦ ♦

Carl Gray, for ten years advertising manager, and the last six years in charge of merchandising, of B. F.

F. A. McClelland

John B. Thomas

Sturtevant Co., Hyde Park, Mass., has been appointed district sales manager of the southern territory of this company, with headquarters in Atlanta, Ga. Mr. Gray is succeeded as advertising manager by L. F. Cashen, who formerly was his assistant.

♦ ♦ ♦

W. H. Braley has become associated with Peter A. Frasse & Co., New York, as field engineer, specializing on Shelby, seamless steel tubing. Mr. Braley for the past eight years has been acting in the capacity of field engineer for National Tube Co., Pittsburgh, beginning his affiliation with that company in 1912, at the Ellwood works.

♦ ♦ ♦

K. W. Atwater, well-known rolling mill engineer, who up to three years ago was connected with H. A. Brassert & Co., Chicago, has become associated with the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., whom he will represent in the western Pennsylvania and eastern Ohio districts, with headquarters at 413 Investment building, Pittsburgh.

♦ ♦ ♦

B. E. Pheneger has been appointed superintendent of the Central Furnaces, Cleveland, of the Carnegie-Illinois Steel Corp.

♦ ♦ ♦

Charles L. Cruikshank has been appointed manager of the ceramic department of Great Lakes Foundry Sand Co., Detroit. He is a graduate of the University of Michigan, and has been interested in the non-metallic minerals industry for several years. He will be actively engaged in the sale of Napheline Syenite, a new ceramic raw material.

♦ ♦ ♦

LeRoy Holt, formerly purchasing agent of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been named head of the newly-created sales promotion division of the company, which has been set up to develop new outlets and uses for steel.

Richard Shively has been made purchasing agent, succeeding Mr. Holt. He has been connected with the company for approximately 32 years.

♦ ♦ ♦

David J. Gemmell has been appointed general sales manager of the Cleveland Chain & Mfg. Co., Cleveland. He formerly was in charge of the Chicago office of the company.

♦ ♦ ♦

William J. Fitzgerald, long identified with the construction and building industry in Minneapolis and the northwest, has joined Joseph T. Ryerson & Son Inc., Chicago. He will be located at Minneapolis and will cover Minnesota, North Dakota, South Dakota, and Montana in the interests of the Ryerson reinforcing, fabricating and building products division. He formerly was with the Paper Calmenson Co., St. Paul, and prior to that was with the Truscon Steel Co.

♦ ♦ ♦

C. R. Messinger, chairman of the board, Oliver Farm Equipment Co., has been elected president of the company, succeeding M. H. Pettit, who has resigned as president and director.

♦ ♦ ♦

Glenn L. Bierly has been appointed general purchasing agent of Empire Sheet & Tin Plate Co., Mansfield, O. Serving with Mr. Bierly in this capacity is Robert W. Cellers, specializing in the purchase of raw materials.

After service in the World war, Mr. Bierly became affiliated with the Empire organization as credit manager, later serving as auditor and comptroller. Along with his new duties as purchasing agent, Mr. Bierly has also been appointed assistant treasurer.

Glenn L. Bierly

Mr. Cellers, prior to his present position, was special liquidator for the company at the time of dismantling its Waddell and Thomas properties.

♦ ♦ ♦

L. A. Estes has been appointed manager of the newly-organized commercial division of the Carngie-Illinois Steel Corp., with headquarters at Pittsburgh. He formerly was connected with a steel company in New England.

Edward G. Budd Mfg. Co., Philadelphia, is negotiating the sale to British interests of the British Pressed Steel Co. common stock held by the Budd International Corp.

Editorial

Strip Was Leader of Gains In Finished Steel in 1935

STATISTICS on the production of steel ingots and the distribution of finished rolled steel in 1935 not only show the effect of government influence upon business but they also reveal striking changes in the form in which steel is being employed.

According to the figures of the American Iron and Steel institute, the output of steel ingots during the past year was 33,425,576 gross tons, compared with 25,599,118. This represents a gain of approximately 31 per cent.

While the institute's official figures on finished steel will not be available for some months, an indication of the output can be gained from the tonnage reported to STEEL for its annual compilation of the distribution of finished rolled steel. The production for 1935 and 1934, as reported to STEEL, are as follows:

	1934	1935	Increase Per Cent
	Gross Tons		
Rails heavy and light	1,007,746	709,046	29.6†
Angle bars, steel ties and other track accessories	377,146	325,323	13.8†
Plates	1,178,666	1,381,868	17.2
Structural shapes,over 3 inch	1,048,077	1,211,084	15.6
Bars, except concrete and shapes under 3 inch	2,189,248	3,381,981	54.5
Concrete bars	401,986	451,841	12.4
Black plate for tinning	1,418,182	1,866,684	31.6
All other black plate and sheets, except galvanized	2,496,317	3,708,187	48.5
Galvanized sheets	780,709	943,207	20.8
Strip steel	1,907,194	3,112,748	63.2
Tubing and pipe	1,565,524	1,577,587	.8
Wire products	1,254,060	1,850,621	47.5
All other finished steel products	245,841	299,533	21.8
Total finished rolled steel	15,870,696	20,819,710	31.2
Total steel ingot production*	25,599,118	33,425,576	30.5

†Decrease. *From report of American Iron and Steel institute.

It will be noted that increases in output were registered by all products except rails and track accessories. The decline in these two items undoubtedly is due to the action of the federal administration in extending aid to the railroads to purchase track equipment in 1934. It is quite apparent that the purchases in 1934 were made at the expense of natural consumption in 1935. Had the roads purchased in accordance with their own decisions, it is likely that consumption in 1934 would have been in the neighborhood of 750,000 tons and consumption in 1935 would have been around 1,000,000 tons.

The experience in track material furnishes a splendid example of the difficulties encountered in economic planning. It makes one wonder whether in the long run artificial aids are more or less effective than the automatic correctives which are inherent in the operation of the law of supply and demand.

Perhaps the most striking feature of the production and consumption figures for 1935 is the strong emphasis given to the light flat rolled products. This is particularly noticeable when the gains of 1935 are compared with those of 1934. A year ago when we compared 1934 tonnages with those of 1933, it was shown that the greatest increases were registered by rails, track accessories, structural shapes and tubing and pipe. In 1935 rails and track accessories showed losses, structural shapes showed a gain of less than 16 per cent and tubing and pipe showed almost no change.

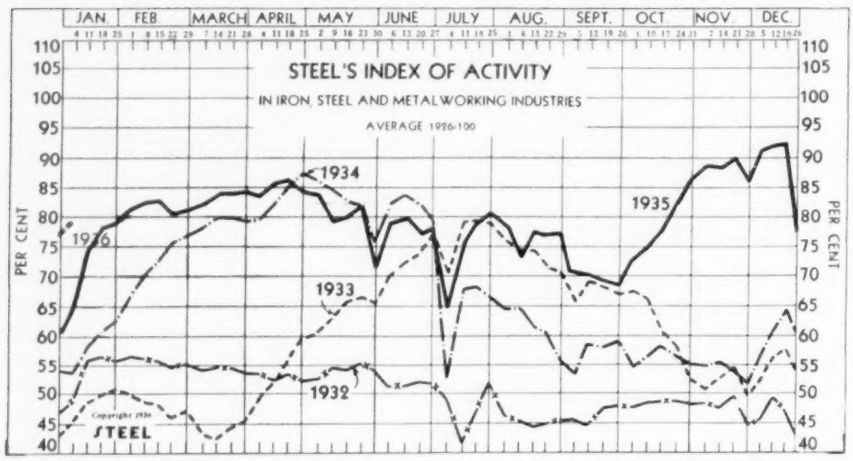
Automobiles, Home Furnishings Take Most Strip; Soon Will Pass Bar, Sheet Tonnage

The leading increases for the past year were in strip steel, black sheets, bars, wire products and tinplate. A study of the table will show that the increase in the production of strip steel surpasses the gain of any other finished steel product. Moreover, strip steel seems to be strongly entrenched in third place among finised rolled steel products. In view of the tendency toward the greater use of steel in this form it is likely that the tonnage of strip steel in the near future will surpass that of bars and sheets.

The outstanding consumer of strip steel is the automotive industry, which in 1935 took 57 per cent of the total output. Second in importance as a consumer was house furnishings, which embrace furniture, stoves, refrigerators, etc. Other important consumers were agricultural implements, machinery and containers. The extent of the diffusion of strip steel into scores of other consuming outlets is indicated by the fact that the distribution of that product to miscellaneous or unclassified industries amounted to 538,989 tons, which is the largest tonnage thus distributed for any finished steel product in 1935.

The figures go far in re-emphasizing the tremendous force of developments in the continuous strip industry. The significance of the changes surrounding this development will be felt by every plant in the metalworking industry.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained 0.8 points to 78.1 in the week ending Jan. 4:*

Week ending	1935	1934	1933	1932
Nov. 2	86.4	55.0	52.3	48.5
Nov. 9	88.4	54.9	50.7	47.7
Nov. 16	88.8	55.2	52.6	49.2
Nov. 23	90.9	54.4	55.4	44.5
Nov. 30	86.0	51.9	49.7	45.3
Dec. 7	91.7	56.8	52.6	46.6
Dec. 14	91.8	60.6	56.0	49.3
Dec. 21	91.9	64.4	58.0	46.9
Dec. 28	77.3†	60.8	53.7	42.9
	1936	1935	1934	1933
Jan. 4	78.1*	65.4	53.6	45.3

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Business Enters 1936 Race With Head Start over 1935

INDUSTRIAL activity starts the new year at an encouraging level. STEEL's index for the week ending Jan. 4 stands at 78.1, compared with 65.4 in the corresponding week of 1935. This is a gain of 19 per cent.

The improvement is unevenly distributed among the four factors upon which the index is based. Revenue car loadings are estimated at about 536,000, as against 498,073 in the corresponding week a year ago. Electric power output was 1,854,874,000 kilowatt-hours compared with 1,669,000,000 in the 1935 week. The steelworks operating rate was just over 50 per cent, whereas a year ago it entered the new year at 42.5 per cent. Automobile assemblies were 65,840; in 1935 they were only 42,003 units. The gains for these four factors are respectively 8, 11, 21 and 57 per cent.

Another week or two must elapse before the current figures will truly reflect the strength of the recovery from the year-end interruptions. Business faltered in its stride more noticeably at the beginning of 1936 than at the dawn of 1935. Observers will be alert to see whether or not this presages a slower upturn throughout the remainder of January.

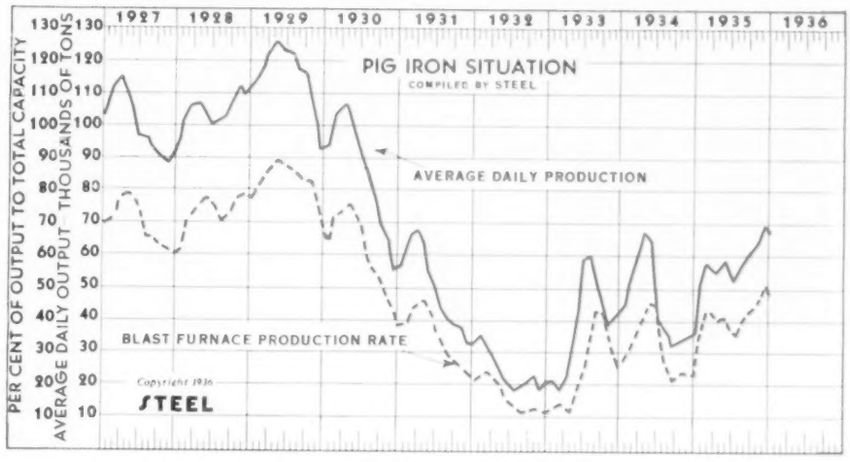
The President's amazing night "message" to congress and the supreme court's ruling against AAA are factors which may color the trend of business during the next few weeks. Several months elapsed before industry adjusted itself to its freedom from NIRA. Probably the country will bridge the confusion of the AAA decision in a shorter period of time.

	1935	1934	1933	1932
Jan.	91	78	65	72
Feb.	89	81	64	69
March	88	84	60	67
April	86	85	67	63
May	85	86	77	60
June	86	84	91	59
July	86	75	100	58
Aug.	87	73	91	60
Sept.	89	71	84	66
Oct.	95	73	77	67
Nov.	97	74	73	65
Dec.		86	75	66

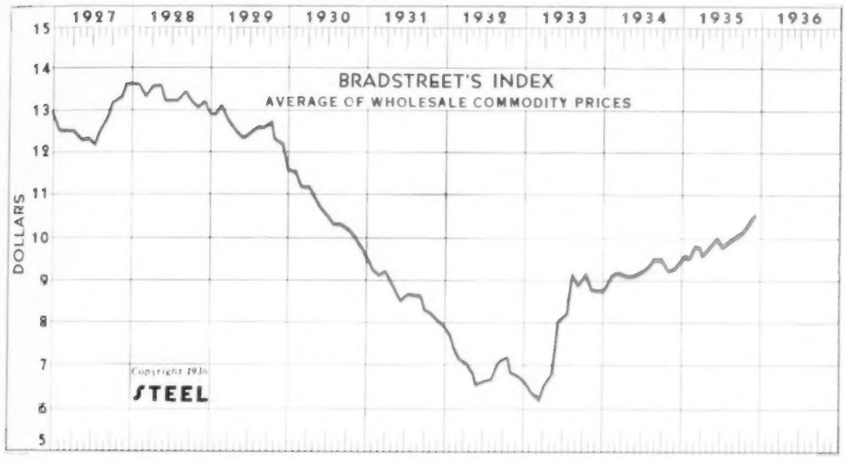
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
INDEX OF INDUSTRIAL PRODUCTION
ADJUSTED FOR SEASONAL VARIATIONS - DAILY AVERAGE 1923-25=100
COMPUTED BY FEDERAL RESERVE BOARD
PER CENT
STEEL

Pig Iron Output Off Slightly in December

	Daily Average Tons,		Blast Furnace Rate, Per Cent	
	1935	1934	1935	1934
Jan.	47,692	39,537	34.2	28.3
Feb.	57,675	45,385	41.4	32.5
Mar.	57,120	52,438	41.0	37.5
April	55,719	57,873	40.0	41.4
May	55,986	66,370	40.2	47.5
June	51,949	64,563	37.2	46.3
July	49,043	39,630	35.2	28.4
Aug.	56,767	34,199	40.7	24.5
Sept.	59,009	29,969	42.5	21.5
Oct.	63,818	30,689	45.8	22.1
Nov.	68,876	31,030	49.5	28.3
Dec.	68,275	33,161	49.0	23.7



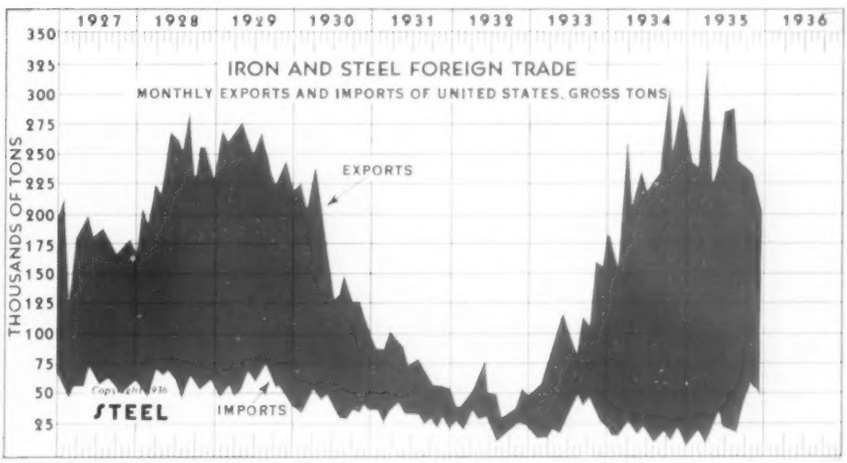
Commodity Prices Highest Since 1930



	1935	1934	1933
January 1	$9.49	$9.01	$6.53
February 1	9.78	9.26	6.35
March 1	9.79	9.17	6.54
April 1	9.66	9.16	6.98
May 1	9.79	9.14	8.02
June 1	9.90	9.24	8.34
July 1	9.84	9.32	9.01
August 1	9.91	9.48	8.99
September 1	10.00	9.45	9.05
October 1	10.17	9.27	8.84
November 1	10.28	9.29	8.81
December 1	10.40	9.49	8.83

Iron and Steel Foreign Trade Lags in November

	Gross Tons			
	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,260
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
June	33,208	289,687	24,848	219,406
July	31,894	296,802	17,676	233,186
Aug.	31,312	247,312	32,418	242,947
Sept.	53,158	244,419	23,847	301,330
Oct.	59,569	238,358	22,202	220,209
Nov.	56,637	205,242	35,272	299,263
Dec.	.....	.....	19,708	282,655



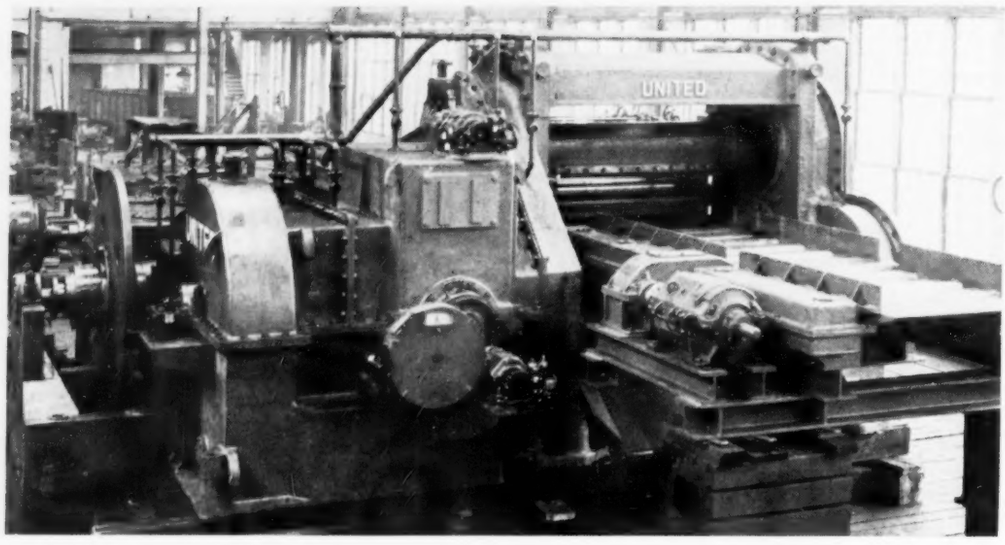


FIG. 1—Rotary flying sheet shear of the crank type, built by United Engineering & Foundry Co., Pittsburgh

SELECTION AND USE OF SHEAR BLADES

BY M. K. MELLOTT

SHEARING of metals, in almost every phase of manufacture in the metal industries—from the ingot stage to the finished metal product—constitutes an important step in the manufacturing procedure. Each shearing operation requires a different type of machine. For example, there are sheet mill shears, billet shears, bloom shears, flying billet shears, tin plate shears and rotary slitting shears, some of which are shown in Figs. 1, 2, 3 and 4 .

With such a variety of different types of machines and materials to be sheared, both hot and cold, and in various stages of manufacture, it is readily seen that many variables enter into the proper selection of the shear blade which will give the most satisfactory service. Following the selection of the shear blade, it is important to use it properly in order to obtain the full benefit of its properties.

Details of Processing

In order to understand more clearly the proper selection and use of shear blades, it is advisable to know something of the manufacture of shear blades, their heat treatment and finishing. To illustrate, the procedure of a leading manufacturer of shear blades will be reviewed.

For more than a third of a century the Braeburn Alloy Steel Corp., Braeburn, Pa., has been engaged exclusively in the manufacture of tool steels. For many years, this company's research department has been developing and perfecting special alloy steels for shear blade manufacturers.

Recently this company has undertaken the complete finishing of shear blades and slitter knives in its own mills. Electric furnace steel is cast, forged, machined, hardened, drawn and ground. Moreover, a finished blade never leaves the plant without an individual record being made of the compositon, heat treatment and resultant hardness of that particular blade. This record is then kept up to date, as data on the history of that blade in service are received.

To select the proper shear knife blade, certain information must be obtained, such as type of shearing machine, speed, stroke, thickness of material to be sheared, temperature, general hardness characteristics and condition of material to be sheared, either clean or with scale. The types of steel to be sheared, either hot or cold, are also determining factors in the selection of the finished blade; also, the gage of steel to be sheared.

The usual procedure in making shear blades is as follows:

1. Selection of material and manufacture of steel.
2. Layout.
3. Rough machine and grind.
4. Heat treatment.
5. Finish and grind.

Since shear blades must withstand severe working conditions, materials from which they are made must be selected carefully as to alloy content;

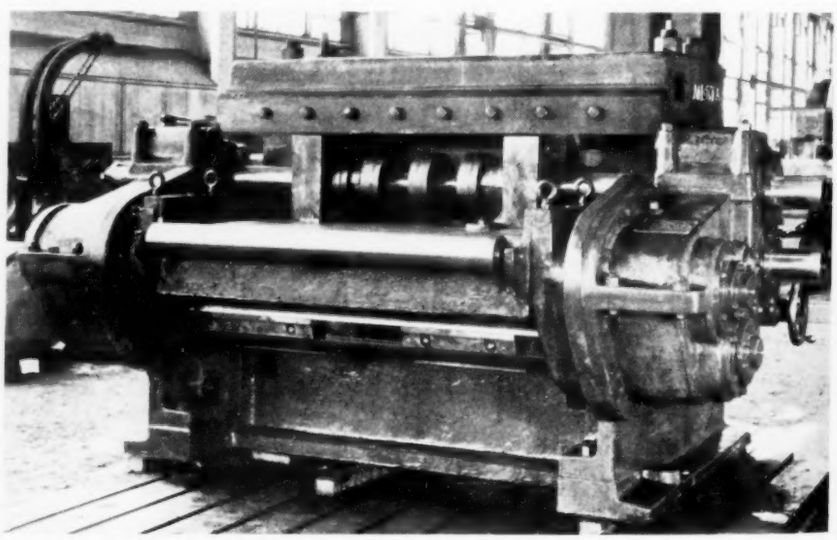


Fig. 2—Rotary slitting shear, built by Mesta Machine Co., Pittsburgh

the steel must be basically of high quality, preferably made in electric furnaces, and it must be low in nonmetallic inclusions and phosphorus.

In the Braeburn plant all melting starts from a cold charge of selected raw materials. Tests are made until the required compositon is attained. Four basic analyses are used, each of which requires different temperature for forging, annealing and metallurgical examination.

Compositions vary in accordance with requirements of the finished blades. Carbon content ranges from 0.5 to 2.25 per cent and chromium from 0.08 to 14 per cent, with varying amounts of other alloys including vanadium, molybdenum, cobalt and nickel.

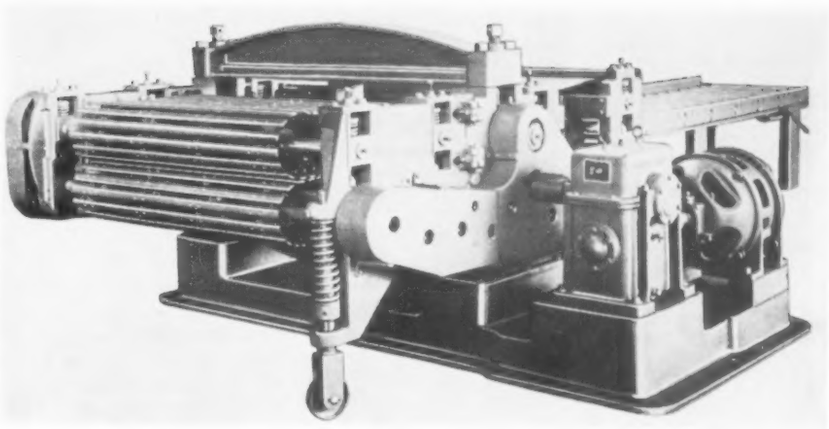


Fig. 3—Slitter built by Steine Tool & Mfg. Co., New Bremen, O.

Ingots Forged to Billets

Following casting, the ingot is rough machined to remove surface imperfections. In making bar stock or billets, ingots are never rolled. They are produced by hammer cogging or forging because this produces a more satisfactory structure throughout the finished bar. Processed billets are reheated before cogging to proper size, allowing for final machining. Metallurgical examinations are made to determine soundness and freedom from inclusions.

In order to relieve forging strain, the billets are normalized before annealing. The latter is accomplished in electric furnaces with automatic temperature control and, before finishing of heavy or long blades, further annealing is given to prevent warpage in the finished blade.

The heat treating installation at the Braeburn plant, comprises both electric and gas furnaces with automatic temperature control. The heat treating operation is carried out carefully by experienced operators under the supervision of the metallurgical department to insure proper structure, hardness and other desirable properties.

Shear blades are heat treated so as to be sufficiently hard to withstand the wearing action during service, and at the same time to be sufficiently tough not to crack or chip. The hardness of shear blades used for cold working ranges from 45-65 Rockwell C, depending upon the application, but in majority of cases it is over 55.

Accuracy in the finished blade is dependent largely upon the selection of the proper grinding machine and of the proper wheel for this machine, in order to control the desired cutting edge. Rotary flying shear knives are ground to 0.0005-inch on all dimensions. In addition, they must be within 0.001-inch from end to end. Ordinary knives are held within 0.003 to 0.005-inch in height and thickness. Slitter knives are ground to bore 0.002-inch plus, 0 minus; thickness to 0.001-0.002-inch.

The final steps in the manufacture of shear blades—heat treatment and grinding—are perhaps most important in determining the surface conditions of the blades. If care is not exercised in grinding, blades develop a network of surface cracks, which cannot always be seen on the polished surface, but which can be brought out distinctly by boiling in a solution of equal parts of hydrochloric acid and water. They usually comprise a system of cracks more or less parallel to each other and at right angles to the direction of grinding.

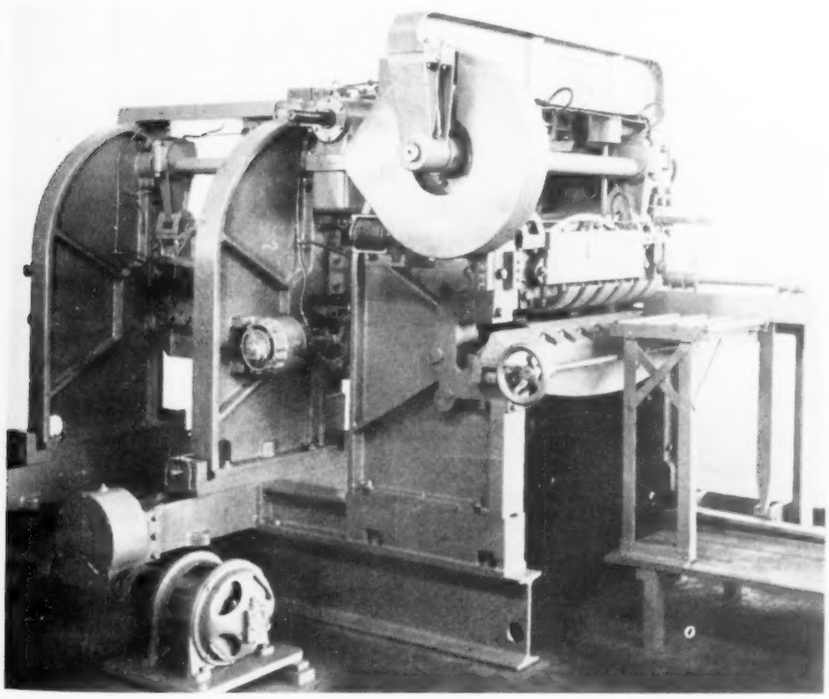


Fig. 4—Multicut shear built by Steine Tool & Mfg. Co.

Sources of Failure

Frequently, so many short cross cracks appear that the surface has a mosaic structure. These cracks may be superficial, but they establish planes of weakness, from which deeper cracks develop, ultimately causing a failure of the blade. Metallurgical investigations of these failures show they may result from improper heat treatment and/or from abusive grinding.

Any hardened piece of steel contains high locked-up stresses. Sometimes these stresses are so high that the steel cracks during or after the quenching operation without any other external influences. Usually, however, these internal stresses set themselves into a sort of equilibrium, so that a quenched steel may be kept in such state for a long time, if not indefinitely, providing the steel is not worked further. Tempering relieves these internal stresses, brings quenched steel to a more stable state, and reduces the danger of cracking. If, however, a quenched and untempered, or insufficiently tempered, steel

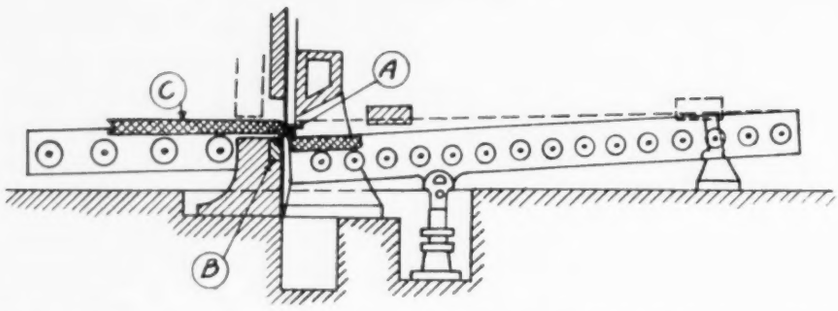


Fig. 5—Bloom shear diagram, in which A *is the upper blade,* B *the lower blade and* C *the bloom*

were subjected to a grinding operation, removing a layer of material from its surface, the quenching stresses are thrown out of equilibrium and may cause separations of material at the surface, known as grinding cracks. On the other hand, an abusive grinding may result in the same effect in a properly hardened and tempered steel.

Avoid Heat in Grinding

During the process of grinding, noticeable surface discoloration, indicating faulty work, is a warning. The cause is usually the generation of excessive heat upon the surface of the part being ground from the friction of a glazed grinding wheel, or from heavy feeds. Generation of such excessive heat upon the surface of a hardened blade causes this surface to expand, which in turn sets up stresses that cause the surface to crack either in the sudden overheating or subsequent cooling. For finish grinding it is advisable to use a soft wheel and light cuts together with rapid passes over the work and generous flow of cooling solution at the point of contact. Finally, if conditions permit, it is well to return the blade to the heat treating department for a final stress relieving treatment at about 300 degrees Fahr., just before the finishing touches by light grinding.

Maintenance of shear knives is high, due largely to mechanical imperfections of shearing machines developing during service, such as misalignment, misadjustment and general mechanical troubles. These conditions cause dullness of blades, imperfect cuts and often complete breakdown of mill operations—costly due to time required for replacements. Little loss in scrap is ever produced during the shearing operation because replacements are made immediately upon discovery of improper cutting from any cause.

Bloom Shears

To enable a cogging mill to be worked to the best advantage, a heavy shear is required to cut the ingot into sections of accurately measured lengths, so that each piece, when taken to other mills, shall have the precise weight wanted to make the particular section desired with the least possible waste from cropends. In Fig. 5, *A* is the upper blade and *B* the lower. The piece to be cut, *C*, enters from the left. Such a shear, varying in size and design technicalities, may be used for a large variety of metallic products, such as plate, sheet, strip, bars, rods and the like. It may be either completely automatic, semi-mechanized, or hand operated.

Flying Shears

The flying shear is used for rapid cutting of light materials, such as bars, sheets, strips and the like. It comprises an upper sliding blade *A*, in Fig. 6, attached to an inclined link *B* which is attached to a swinging frame. The bar to be cut, *C*, is traveling rapidly between the blades in the direction of the arrow. Positions 1, 2 and 3 show successive steps. The bar is then returned to Position 1, ready for the next cut, all this occurring in less than one second, or at a speed of about 300 feet per minute.

In the types of shears discussed so far, the upper movable knife may have its cutting edge parallel to the edge of the stationary lower knife, in which case the stress distribution is uniform along the entire line of contact between the sheared material and the knives; or it may be inclined so that the stress distribution is concentrated at one point at a time. The angle of inclination is variable.

Rotary Shears

A rotary flying shear is used for shearing sheets and strips. Two flat knives are set on suitable shafts (Fig. 7) and rotate at a constant speed, determined by practical requirements in the direction indicated by the arrows. The material, usually a continuous strip, is fed from the left, either by hand or by a suitable mechanism, and is sheared in a straight line by a contact with the knives at a single point. Sometimes two pairs of rotary knives, one on each edge of the plate or strip are used. All usually are power-driven. By adjusting their positions to any desired width, any amount of scrap may be removed from both edges of a plate or strip simultaneously. The scrap is usually delivered through chutes to another shear, where it is chopped into short lengths.

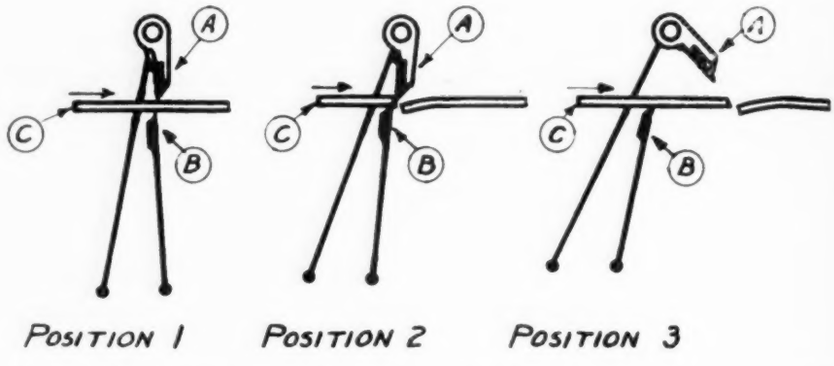


Fig. 6—Diagrammatic illustration of the operation of a flying shear, in which A *is the upper blade,* B *the lower blade and* C *the bar to be cut*

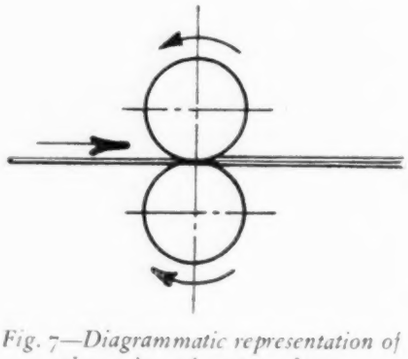


Fig. 7—Diagrammatic representation of the action of rotary shears

Rotary Anvil Flying Shear

As a special type, the rotary anvil flying shear may be mentioned. As the material, strip or plate, passes at an adjustable speed of up to 2500 feet per minute over a large roller (the anvil) rotating knives make a quick revolution in a circle tangen-

tial to the anvil, and at the point of intersection snip or pinch off the material. The action is so quick that there is no interruption in travel of the material either in front or behind the shear. The movement of the rotating knives is fully automatic, and they are adjusted before starting to within a few thousandths of an inch clearance.

Great care must be exercised in settting shear blades. They must be placed in a perfectly vertical position with proper clearance between them. The vertical position will give a uniform stress distribution over the surfaces of the blades, resulting in minimum wear. Clearance, as governed by the thickness and hardness of the sheared stock, is adjusted at 0.003-0.009-inch. When the blades are set properly on the strength of these considerations, the shearing operation will result in a smooth rectangular cut as shown in Fig. 8 (top), with perhaps a small projection of the edges, depending on the ductility of the sheared stock. Fig. 8 also shows incorrect settings and their results.

Effect of Poor Setting

If the blades are set too far apart, the resultant cut will be rounded with a considerable projection of the edges.

Too close a setting of the blades will result in a rough cut. Besides it will put an unnecessary strain on the inner edges of the blades, resulting in premature wearing.

An inclined setting of either one or both blades is detrimental with respect to both quality of the cut and wear of the blades. The resultant cut will inevitably either be rounded or oblique with strongly projecting edges. Moreover, unnecessarily excessive pressure will develop on the blade edge, which will first come in contact with the sheared stock, resulting in rapid wear.

These considerations apply equally well, with perhaps small modifications, to all types of shears, including straight knives, rotary, flying shears, etc., working at all temperatures.

As an example of a material difficult to shear, magnetic sheets, usually containing about 4 per cent silicon and practically no carbon, may be considered. This material is inherently brittle even in the annealed state. For this reason, in shearing, cold blades made of a hard steel must be used. The edges of the blades must be kept sharp all the time, and clearance between them must be kept as small as possible. Shearing must be performed with fast, powerful movement to insure a smooth and sharp edge and to avoid fracturing.

In selecting correct material, heat treatment, type and setting of the shear blades several items should be kept in mind:

1. Nature of the sheared stock.
2. Thickness of the sheared stock.
3. Temperature at which shearing will be performed.
4. Type of machine in which the blades will be used.
5. Speed of shearing.
6. Importance of the quality of the cut.
7. Heat treating and machine-shop facilities at the plant where the blades will be used.

Shear blades should be subjected to periodic inspection, sharpening, superficial grinding and, perhaps, light tempering, to relieve the mechanical strains set up in the blade edges. All these will help to prolong life of the blades, to improve their performance and quality of the sheared stock, and to avoid undesirable accidents and interruptions in the operation of the plant.

Results of Three Tin Researches Published

Three pamphlets dealing with striations in tin coatings on copper, electrodeposition of tin alloys from alkaline stannate baths and the atmospheric corrosion and tarnishing of tin have been published by the International Tin Research and Development Council, 149 Broadway, New York.

Irregular cooling of tin coatings on copper produce striations of alternate smooth and mottled surfaces across the single crystals of tin. Drs. Bruce Chalmers and W. D. Jones, authors of the pamphlet on striations, say this effect is due to the crystal facets being inclined to the surface in a periodically varying manner within the single crystals of tin.

Preliminary investigations into the possibility of modifying the stannate baths used in electrodeposition of tin to produce coatings of tin alloyed with other metals in order to harden them are described in the pamphlet prepared by R. G. Monk and H. J. T. Ellingham.

New quantitative information obtained by L. Kenworthy in his research into the resistance to tarnishing and corrosion of tin and two tin alloys containing, respectivevly, 2 per cent antimony and 0.2 per cent copper, is published in the third pamphlet.

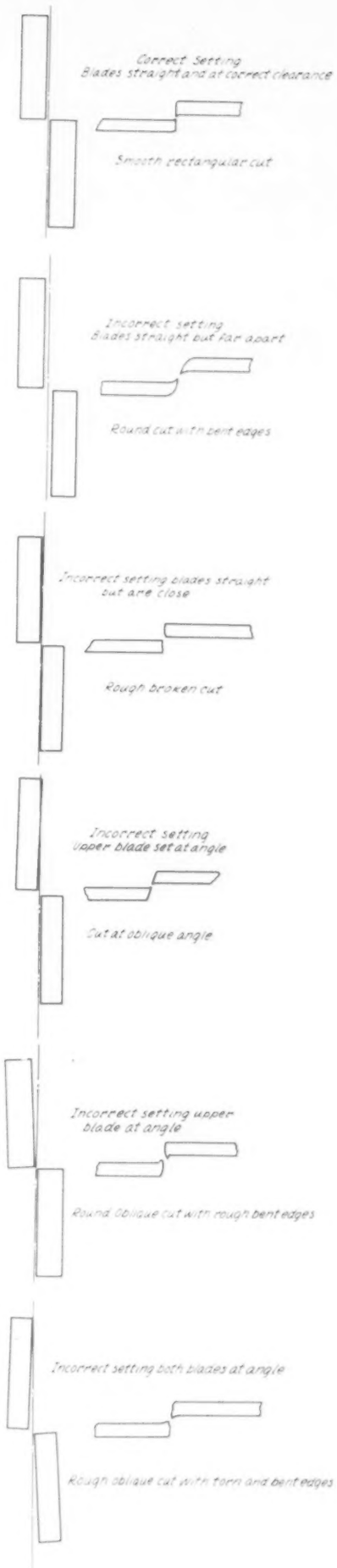
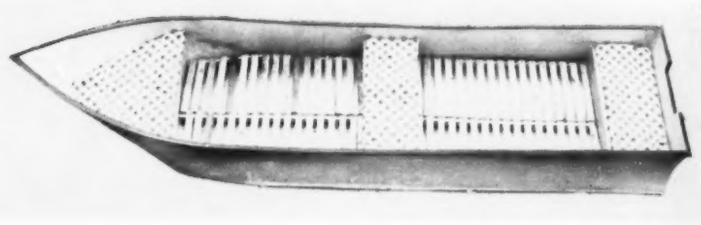

Correct Setting
Blades straight and at correct clearance
Smooth rectangular cut
Incorrect setting
Blades straight but far apart
Round cut with bent edges
Incorrect setting blades straight but are close
Rough broken cut
Incorrect setting
Upper blade set at angle
Cut at oblique angle
Incorrect setting upper blade at angle
Round oblique cut with rough bent edges
Incorrect setting both blades at angle
Rough oblique cut with torn and bent edges

Fig. 8—These sketches show, in exaggerated form, the correct and incorrect settings for shear blades and the resulting shearing actions

Speed and Rowboats Are Built of Steel Sheets

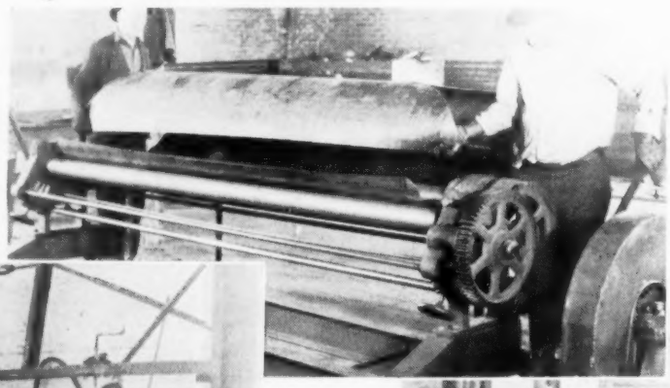


Boats of this type, of welded construction, now are being built in 11, 12, 14, 16 *and* 18-*foot lengths, of* 20, 22 *and* 24-*gage steel sheets*

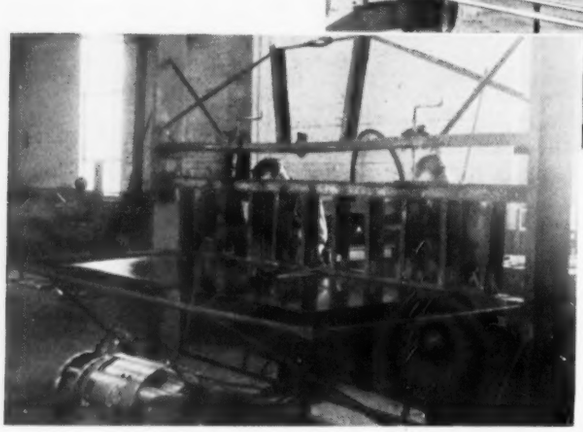
A NEW line of speed and rowboats developed by the Gil-Boat Co., Holland, Mich., is constructed of steel sheets, due to the design and safety values possible with this material. Instead of the conventional boat bottom of flat, V-shaped, hexagonal or step-type design, the bottoms of these new boats are designed with a series of reverse curves, scientifically placed, resulting in a strong, rigid, ribless boat that is easy to handle and easy to maneuver. The boat has no sharp prow, no keel and no braces. It gains its strength and rigidity from rolled curves. The bottom has no flat parts whatever.

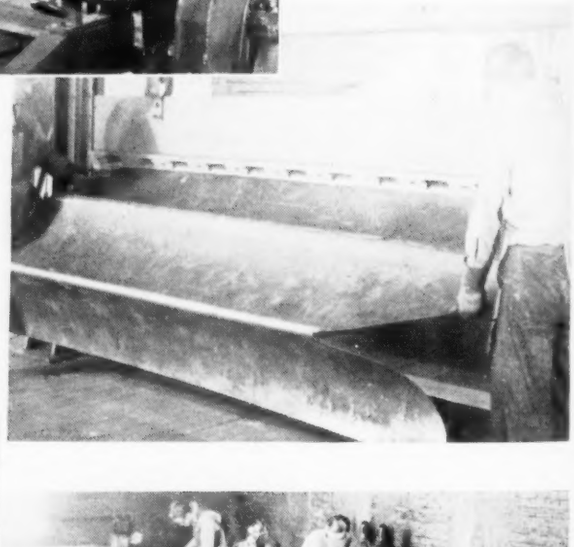
Because of this "tunneled" design, says the maker, the new boat, when used as a speedboat, does not pound or spank. With an outboard motor of small horsepower it planes quickly and smoothly, rising to the very top of the water surface. At the present time the company is producing the boats in 11, 12, 14, 16 and 18-foot lengths. The 11-footer is a small rowboat weighing 80 pounds so that it can be carried on a car without

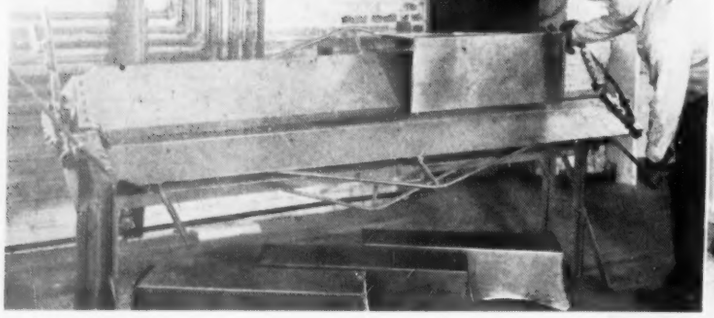
WELDING of large sheets is shown at top left while at lower left is illustrated the forming of the center seats on a hand brake

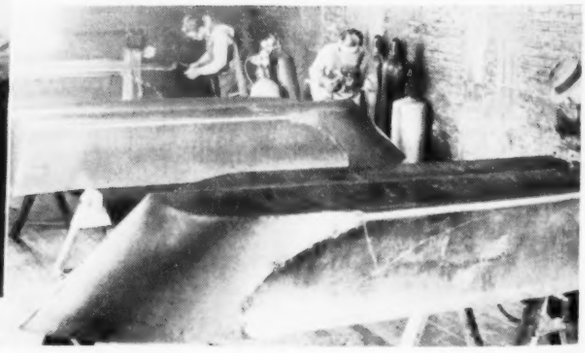


ROLLING of the hull is shown at left while at top right is illustrated the first brake operation on the hull. At lower right is a view of the welding room







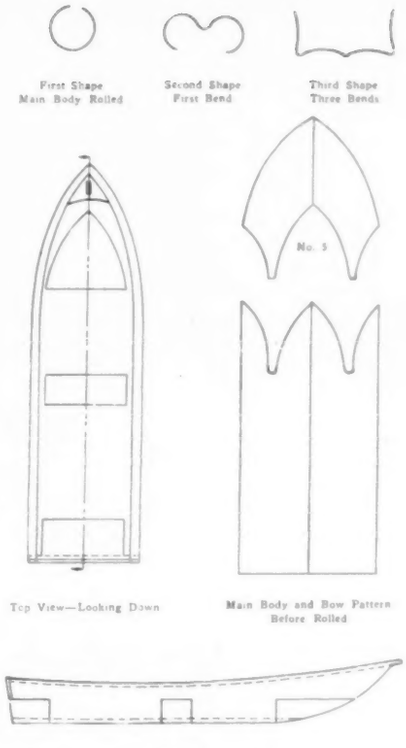


trailer. The 12-foot boat weighs 107 pounds and will plane with a 1½-horsepower motor and attain a speed of 40 to 50 miles per hour with a 12 to 16-horsepower motor. The company hopes to build these boats in sizes for ocean use in the future.

The accompanying drawings show the stages of construction of the new boat. First the hull sheet, of correct dimensions, is rounded into a circle; next this article is given a reverse curve in a braking operation; two more bends on a brake give it its final cross-section, as shown. The drawings further illustrate the construction; one of them shows the flat pattern of the main body of the boat before it is rolled while above it is the front body or prow which is welded to the hull. Another view shows how the stern and seats are positioned in the hull by welding. The profile view, at bottom, shows the positioning of the air tanks, also attached to the hull by welding. The company stresses the fact that every part of the boat is formed by rolling, and that all joints are welded, thus resulting in a strong, leakproof boat.

Copper bearing sheets, in 20, 22 and 24 gages, are used for the construction of these boats. Electric and oxyacetylene welding are employed, the latter being used on the long seams. The boats are treated with a deoxidine wash and covered with a primer coat of aluminum with cresote base, after which any good paint is applied.

One of the boats, fitted for service, but minus motor, is shown in an accompanying illustration. Other views illustrate the fabricating methods.



Method of developing the "tunneled" bottom design and other features are shown in these drawings

One of them shows the welding of sheets to obtain the proper dimensions. Others show the rolling and braking operations. Another shows the brake-forming of the center seats while the last shows the final welding operation.

Metals in Transportation Symposium Will Feature A.I.M.E. Annual Meeting

AMERICAN Institute of Mining and Metallurgical Engineers has announced the preliminary program for its 145th annual meeting to be held in the Engineering Societies building, New York, Feb. 17-21. Of special interest in connection with technical activities is a symposium on "Metals in New Transportation."

The institute will hold its annual business meeting on Tuesday afternoon, Feb. 18. The annual dinner will be served on the evening of Wednesday, Feb. 19, at which time medal awards will be made and the new president will be introduced.

The tentative technical program is as follows:

IRON AND STEEL DIVISION
Monday, Feb. 17

AFTERNOON

Blast Furnaces and Raw Materials

"Porosity, Reducibility and Size Preparation of Iron Ores," by T. L. Joseph.
"Relative Desulphurizing Powers of Blast-Furnace Slags," by W. F. Hoibrook and T. L. Joseph.
"Carbon in Pig Iron," by W. E. Brewster.

Tuesday, Feb. 18

MORNING

Physical Metallurgy

"Transformation Twinning of Alpha Iron," by A. B. Greninger.
"Variants Influencing the Austenite Grain Size as Determined by Standard Methods," by R. Schempp and C. L. Shapiro.
"Surface Magnetization and Block Structure of Ferrite," by W. C. Elmore and L. W. McKeehan.

AFTERNOON

X-Ray Investigations

"X-Ray Studies on the Preferred Orientation in Cold-Rolled Steels," by M. Gensamer and R. F. Mehl.
"X-Ray Methods in Ternary Systems," by A. G. H. Andersen and Eric R. Jette.
"X-Ray Investigation of the Iron-Chromium-Silicon Phase Diagram," by A. G. H. Andersen and Eric R. Jette.
"X-Ray Study of Iron-Nickel Alloys," by Eric R. Jette and Frank Foote.

Wednesday, Feb. 19

MORNING

General Metallurgy

"Choosing a Composition for Low-Alloy, High-Strength Steel," by S. Epstein, J. H. Nead and J. W. Halley.
"The Action of Solutions of Sodium Silicate and Sodium Hydroxide at 250 Degrees Cent. on Steel Under Stress," by W. C. Schroeder and A. A. Berk.
"New Method for Welding Together Ferrous Metals by Application of Heat and Pressure," by Leonard C. Grimshaw.

AFTERNOON

General Metallurgy

"Results of the International Co-operative Study of Methods for Determination of Oxygen in Steel," by J. G. Thompson and H. C. Vacher.
"Iron Welds Made in Argon and in Air," by Gilbert E. Doan and William C. Schulte.
"Design and Operation of Continuous Reheating Furnaces," by J. E. Eberhardt and H. C. Hottel.

Howe Memorial Lecture

"Correlation of Metallography and Mechanical Tests of Metals," by H. F. Moore.

INSTITUTE OF METALS DIVISION
Tuesday, Feb. 18

AFTERNOON

Metallography

"Coefficient of Equivalence of Iron with Respect to Aluminum in Aluminum Bronze," by J. L. Bray, M. E. Carruthers and R. H. Heyer.
"Microscopic Study of Ancient Bronze and Copper," by C. G. Fink and E. P. Polushkin.
"Creep and Twinning in Zinc Single Crystals," by Richard F. Miller.

Wednesday, Feb. 19

MORNING

Aluminum

"Equilibrium Relationships in Aluminum-Zinc Alloys of High Purity," by W. L. Fink and L. A. Willey.
"Diffusion of Magnesium and Silicon Into Aluminum," by H. R. Freche.
"Density Changes in Solid Aluminum Alloys," by L. W. Kempf and H. L. Hopkins.
"Equilibrium Relation in Aluminum-Magnesium Silicide Alloy Containing Excess Magnesium," by F. Keller and C. M. Craighead.

AFTERNOON

Theoretical Metallurgy

"Precipitation Hardening in Aluminum-Base Alloys," by W. L. Fink and D. W. Smith.
"Age Hardening of Magnesium-Aluminum Alloys," by A. M. Talbot and J. T. Norton.
"Theory of Metallic Crystal Aggregates," by C. G. Maier.

Annual Division Lecture

"Diffusion in Solid Metals," by R. F. Mehl.

METALS IN NEW TRANSPORTATION
Thursday, Feb. 20

MORNING AND AFTERNOON

A Symposium

Address by A. J. Pelley.
"The Heavier Nonferrous Metals in Transportation," by C. H. Mathewson.
"Light-Weight Metals in the Transportation Industry," by Zay Jeffries.
"Trends in the Metallurgy of Low-Alloy, High Yield Strength Structural Steels," by H. W. Gillett.

Surface Treatment

Purchase-Control of Finish Materials

MANUFACTURERS of automotive parts, electric refrigerators, washing machines, gas and electric ranges and thousands of other fabricated units cannot afford to take chances with the finishes on their products. Quality of the finish, and its longevity, are of paramount importance and have a direct bearing on sales. Hence it is essential that the manufacturer establish a control of purchases that will assure him of uniform results with the materials he purchases. The control need not be over elaborate but must be of sufficient accuracy to detect any objectionable deviation from the manufacturer's standards.

Unfortunately, organic finishing materials do not lend themselves readily to simple chemical analyses that simplify the control of most industrial purchases. Consequently, the manufacturer-consumer must resort to the specification of several physical properties which, if controlled, will assure a uniformity sufficient for industrial purposes. These properties or characteristics are: Color, specific gravity, consistency (viscosity), per cent nonvolatile material, and covering power.

It must be remembered that none of these physical characteristics is in any way chemical proof that specific ingredients are in the material. They are simply identifying characteristics of the material as a whole and the purchaser can rest reasonably assured that the materials cannot be adulterated or altered without detection through a change in one of the characteristics.

It is true that finishing materials can be adulterated without changing some charactertistics but it is bound to show in one or more of them. Therefore, if the purchaser applies the following tests to the original sample of the material which has been selected because of its quality, and records the results, he has a measuring stick by which he can gage all subsequent lots of material. It must be borne in mind, however, that reasonable tolerance limits must be allowed in each case since absolute control from a chemical standpoint, by the manufacturer of organic finishing materials, is impracticable if not impossible.

Suggested methods of analysis and control are as follows:

Color

The matter of color control by means of standards has been taken up previously (STEEL, Dec. 23, p. 33). While there are many types of mechanical color analyzers on the market, they all require a considerable investment and the results obtained with them do not warrant the cost. Sufficient control of color and gloss can be maintained by the use of standard panels which illustrate the allowable variations in these properties. These variations should be agreed upon, in advance, by both consumer and producer and the approved panels initialed or signed by both parties.

Specific Gravity

The specific gravity of a material is the ratio between the weight of a given volume of the material and the same volume of distilled water. For instance, a material twice as heavy as water has a specific gravity of 2.0, or if it happens to be half the weight of water, its specific gravity is 0.5. It is again pointed out that the specific gravity of a material is no indication of what is in it, but is merely one of the identifying characteristics which will change if the material is adulterated.

When the materials have a specific gravity of less than 1.1, sufficiently accurate results can be obtained with a hydrometer. For materials with a specific gravity greater than 1.1 it is recommended that the American Society for Testing Materials' standard method of test for the specific gravity of road oils, road tars, asphalt cement, and soft tar, designation D-70-27, be used. Duplicate determinations of specific gravity should agree to three significant figures (i.e. 1.115—1.112). The specific gravity readings may be transformed to weight per gallon in pounds by multiplying by 8.33.

Nonvolatile Material

The nonvolatile matter in an organic finish material is composed of the gums, resins, pigments and plasticizers. In the methods described subsequently, the amounts of these ingredients are measured as whole and no attempt is made to evaluate each individual item. It is evident that changes in any one of the ingredients will change the result of the analysis and while the consumer will not know just what change has been made, he will detect a change and will have grounds for suspecting the lot of material. There are two methods recommended for this determination, each for a specific type of material.

NITROCELLULOSE LACQUERS

For this determination, the following equipment will be required:

1. Light aluminum cups; capacity, approximately 200 cubic centimeters.
2. Glass stirring rods, ⅛-inch diameter, 6 inches long.
3. Analytical balance, and weights.
4. Electric oven, with thermostatic control.
5. Dessicators. A dessicator is a large container with a double bottom

t and Finishing

and a glass cover which has been ground to fit tightly; the ground surfaces are smeared with a mixture of paraffin and beeswax to act as a seal. The bottom of the container is filled with fresh anhydrous calcium chloride, which keeps the interior of the container dry. Samples which have been dried out in an oven are placed in this container to cool, to avoid absorbing moisture during the cooling period. When removed for weighing, the samples should be weighed as quickly as possible or errors may result due to absorption of moisture.

6. Weighing bottles. When volatile liquids, such as lacquers and enamels are being weighed, a special technique is required. The sample to be weighed is placed in a weighing bottle which is a glass container with a ground glass stopper. The sample should first be thoroughly mixed in the can and then transferred to the weighing bottle, filling the bottle. Cover the bottle immediately to prevent loss of volatile solvent and weigh the bottle and sample together. When a sample is to be taken, open the weighing bottle and pour a quantity into the aluminum dish, quickly replace the stopper and weigh the bottle again; the loss in weight is the weight of the sample taken. If an attempt is made to weigh the sample in the open aluminum dish, the evaporating solvent will give erroneous results.

Place a short glass stirring rod in an aluminum dish and weigh on an analytical balance to four decimal places. Transfer approximately 10 grams of thoroughly mixed sample to be tested from a weighing bottle and record the exact weight of the sample taken. Add 100 cubic centimeters of acetone and stir until solution of the material is complete. The acetone solution should then be brought to a boil over a steam bath and 10 cubic centimeters of water added slowly with continued stirring.

It is essential that the stirring be continued until the major part of the acetone has been evaporated to avoid colloidal precipitation. If the precipitation has been carried out properly, a stringy, well defined precipitate will result in most cases with the possible exception of those in which the solid content is extremely low.

If the precipitate is lumpy, redissolve in acetone and precipitate again with water, observing the same precautions as before. The solution should then be evaporated to dryness on a steam bath and subsequently placed in an oven maintained at 100 degrees Cent. for two hours. Cool in a dessicator for 30 minutes and weigh. The residue then should be placed in the oven for one hour drying periods followed by one-half hour cooling periods in a dessicator and weighed until two consecutive weighings check to within 0.5 per cent of the first weighing. The percentage of total solids (nonvolatile material) is obtained from the following equation:

$$\frac{\text{Weight of residue} \times 100}{\text{Weight of sample}} = \%\ \text{solids}$$

If a cloud is formed upon the addition of water, the presence of camphor is indicated. When camphor is present, two or three precipitations should be made, evaporating to dryness after each one, in order to drive off all the camphor.

Varnishes and Enamels

For this analytical procedure, the same apparatus is required as for the above procedure with the addition of a quantity of specially prepared sand. The sand required is a good quality quartz or white silica sand. A good sand is sold by chemical supply houses under the name of Ottawa sand. This sand first should be sieved to remove any foreign matter; then boiled gently in hydrochloric acid (sp. gr. 1.19) for about one hour and washed thoroughly with distilled water to remove all the acid and soluble impurities. Heat the sand over a blow torch to as high a temperature as the torch will allow for about one hour and cool in a dessicator. Preserve the prepared sand in a tightly stoppered bottle.

Place approximately 10 grams of the prepared sand and a short glass stirring rod in an aluminum dish and weigh. Transfer approximately 10 grams of the sample to be tested from a weighing bottle to the dish and record the exact weight of the sample taken. Thoroughly mix the sand and the sample with the glass rod and place the dish, allowing the glass rod to lie on the sand, in an oven maintained at 100-105 degrees Cent. for one hour. Remove the dish from the oven, cool for 30 minutes in a dessicator and weigh. Replace the dish in the oven for another hour, cool in a dessicator as before, and weigh again. Repeat this process until two consecutive weighings check each other to within 0.5 per cent of the first weighing. The percentage of total solids can be obtained by using the same equation as above.

Consistency

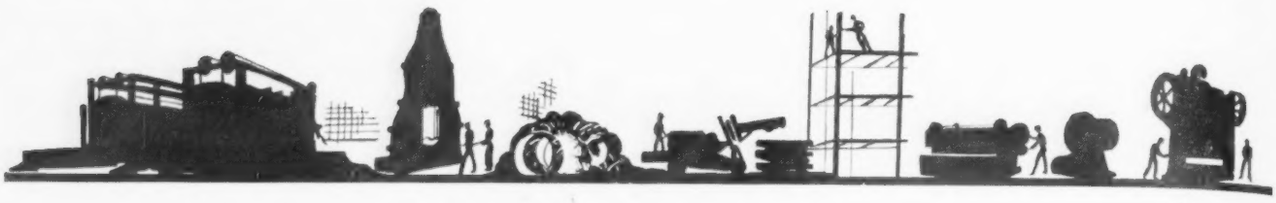
The consistency of a finishing material is measured by the time required, in seconds, for a definite volume of the material to flow through a standard orifice. There are several viscosity cups available on the market but it is recommended that the cups approved and specified by the American Society for Testing Materials under *Consistency Cups A.S.T.M. Specification D333-33T* be used. The procedure may be modified slightly to suit individual requirements but it must be borne in mind that rigid adherence to whatever procedure is used is essential.

Covering Power

Covering power or hiding power is a property which is difficult to measure. Possibly the simplest and most accurate method of measuring covering power is as follows: Tack a 20x24-inch piece of inlaid linoleum of checker board design with black and white squares, each about 2x2 inches on a wooden base. The linoleum then should be rubbed well with linseed oil, wiping off all the excess oil at the end of the process. Weigh a can of the material to be tested together with a brush. Then spot a brushful of the material on each square and close the can. Brush out the material and cross brush until the material is uniformly distributed. If complete hiding of the squares is not obtained at first apply more material, little by little, until they are completely hidden. Reweigh the can and brush and note the weight of material used. From the weight of material used can be calculated the fraction of a gallon used and the covering power of the material can be expressed in square

(*Please turn to Page 37*)

Methods and Materials



Stainless Steel Proving Serviceability In Variety of Dairy Equipment

MANUFACTURERS of equipment used in the food industry are faced with a double problem in the selection of materials. Metals employed must resist the corrosive action of acids with which they may be in contact and at the same time must impart no foreign taste to the food nor cause spoilage. They should also be capable of easy cleaning and sterilization.

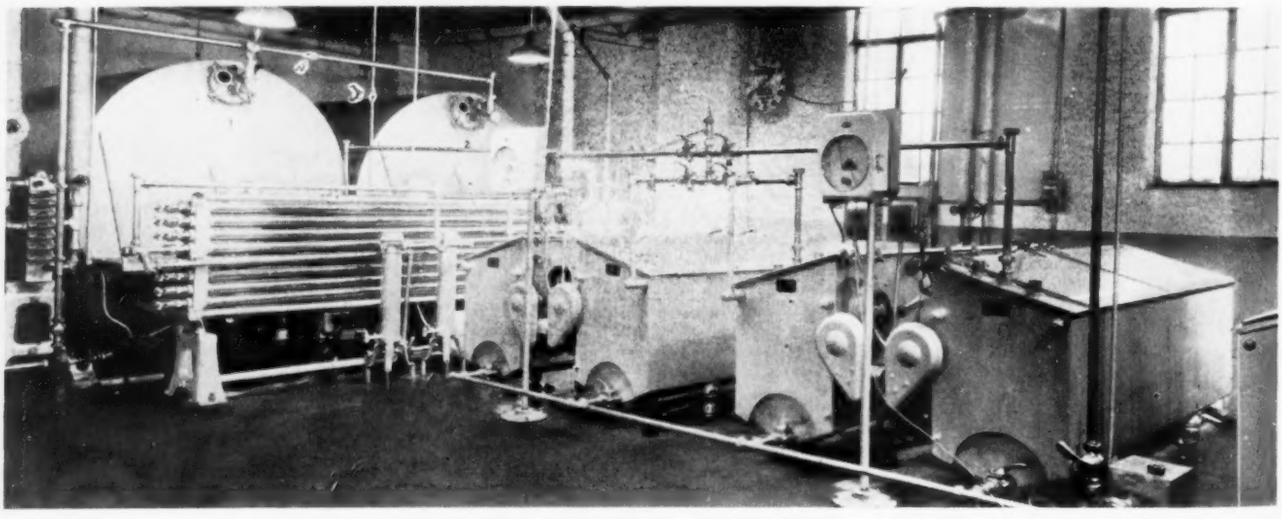
These matters are of particular consideration to the builder of dairy equipment for the reason that milk must be handled carefully to prevent contamination and to guard its taste. Furthermore, the lactic acid of milk has a harmful effect on certain metals. Milk tends to spoil when in direct prolonged contact with copper or iron. Nickel and aluminum do not easily affect milk flavor, but nickel is tarnished by the sulphur in the milk and may be dissolved rapidly by the corrosive action of hot milk. Nickel also is not suited for contact with sour cheese curd because the intense action of the curd acid on this metal tends to discolor the curd.

While chemically pure aluminum is highly resistant to corrosion, metallic impurities in commercial aluminum sometimes tend to cause pitting. Resistance to corrosion is improved further in the case of certain aluminum alloys. Tin is harmless in its action on milk and has been used widely as a coating on copper and iron. Chromium plated surfaces also are satisfactory, provided the coating can be retained. Zinc plating is damaging to milk flavor. Copper alloys yield copper salts, especially where heat is applied and may be undesirable, according to manufacturers, but Monel metal is described as safe for cold milk.

Stainless steel is an ideal material to overcome the various objections to certain other metals in dairy equipment manufacture. It is inert to milk acids, does not impart a metallic taste to the milk and is highly resistant to wear. In addition it is able to withstand the harmful effects of washing powders or chemical sterilizers better than any other common metals—an important advantage.

It is natural, therefore, that stainless steel has become widely accepted for the manufacture of pasteurizers, mixers, tanks, pumps, freezers and other dairy equipment. The start of its extensive use dates back about four years, and since that time annual consumption has developed into a substantial tonnage. Prior to a few years ago tinned copper was the preferred material and the introduction of stainless steel was retarded to a great extent by difficulties in welding it. This latter problem, however, since has been overcome successfully.

More stainless steel is used in the manufacture of pasteurizers than other types of equipment. Illustrated is a typical unit, made by the Cherry-Burrell Corp., Chicago. This company employs 18-8 chrome-nickel steel for the lining which is of welded construction. The bottom of the lining is a full rounded curve. Paddles which agitate the milk during the pasteurizing process also are



DAIRY installation of two 3000-gallon stainless steel lined storage tanks. Pasteurizers in the right foreground are lined similarly

of stainless steel. Different types of finish are available for the body: Veneer sheets of stainless steel, or porcelain enamel, or lacquered aluminum. Covers are of aluminum or stainless steel.

Storage tanks provide another large outlet for stainless steel. The 3000-gallon Cherry-Burrell unit illustrated employes stainless steel for the inner shell, surrounded by 2 inches of insulation and an outer jacket of carbon steel. The inner shell is welded at the joints and seams. Heads of the tanks are dished and meet the side sheets with a 3-inch radius to eliminate sharp corners that are difficult to clean. Welding also is employed in fabricating the outer jacket. The outlet fitting for draining the tank; manhole frame and door for entry of an operator to clean the tank; and the agitator for mixing the contents of the tank are of stainless steel. Occasionally an all-welded stainless steel direct expansion coil is incorporated in the tank to provide additional cooling to the contents.

Stainless Steel Truck Tanks

Truck tanks for the transportation of dairy products are similar to the storage units in design and construction. Aluminum has the advantage over stainless steel of lighter weight and lower initial cost when used for the inner shell of truck tanks. The reduced weight also means a saving in operating cost. The higher tensile strength of stainless steel and better resistance against alkalies, chlorine and various other chemicals commonly used in the cleaning and sterilizing of dairy equipment, however, lead some manufacturers of truck tanks to the conclusion that under average conditions the stainless steel type will be the longer lived of the two. Either light-gage steel or aluminum is used for the outer jacket which is fitted about the insulated inner shell. A typical truck tank employs 0.109-inch stainless steel or 3/16-inch pure aluminum sheets in the fabrication of the lining and 16-gage material when the outer jacket is made of steel.

It is estimated that about 90 per cent of the storage and truck tanks built recently for the dairy industry are equipped with stainless steel linings.

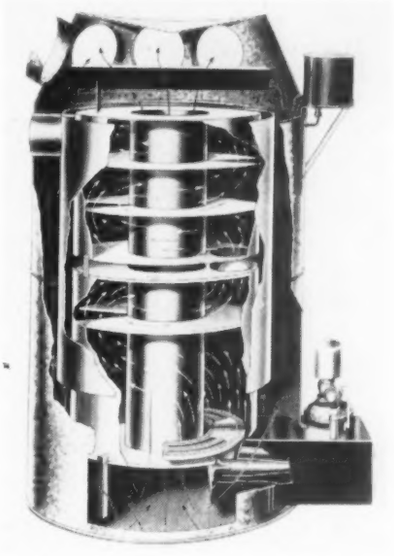
Crane Boom Length Is Doubled by Welding

Light-welded tube construction of the boom was used by the Harnischfeger Corp., Milwaukee, recently in building a small crane with a 50-foot reach and with a rated lifting capacity of 1800 pounds at a 20-foot radius. Actual tests show that this crane can lift 2150 pounds at 20 feet, travel and swing loads at reasonable speed with ample stability.

Booms were made with two inserts of 10 and 15 feet to double the standard length of 25 feet. The machine weighs less than 15,000 pounds. Other special equipment used included high gantry and telescopic boom stops.

Two of these machines were recently completed for the Standard Oil Co. of California for use in the Bahrein Islands between Persia and Arabia where a Standard subsidiary is building a new oil refinery. They will see their first service in erecting oil tanks.

All-Steel Furnace



WITH exception of the burners and venturi, which are castings, this new house heating furnace placed on the market by the Surface Combustion Corp., Toledo, O., is of all-steel construction. It is to be noted in particular that the casing and radiators are of steel. The furnace sets above the floor so that the circulating air can pass beneath, around and through the heating drums while it is being heated. The burning gases have a long travel so that they may impart all their heat to the inner surfaces of the drums. The unit is automatically controlled

National Bureau of Standards Certifies Many Types of Master Gages Each Year

FROM the time the national bureau of standards was organized in 1901, the division of weights and measures each year has tested and standardized precision length standards and measuring instruments for the several branches of the federal government and for industrial concerns. This work gradually increased, and by 1916 the testing of contact length standards, micrometers, and screw thread gages, was sufficient to keep two men constantly employed.

An article appearing in the November issue of *Industrial Standardization*, published by the American Standards association, 29 West Thirty-ninth street, New York, reviews the work of the bureau of standards in connection with the testing and certification of master gages.

Because accurate gages are a vital necessity in the manufacture of munitions, the work of the bureau was expanded to a large degree in 1917 to provide for the many demands of the war and navy departments and of manufacturers having contracts for war material. This led to the organization of a new section within the division of weights and measures which is now well known throughout the mechanical industry as the gage section of the national bureau of standards. Started as a war activity, this work has become an important peacetime service to industry.

Representative examples of the importance of limit gages in interchangeable manufacture are these: The production and inspection of the Springfield army rifle requires the use of 1263 gages; a machine gun about 2200 gages; and one make of automobile about 15,000 gages. The ordnance department of the war department has under its charge in the various arsenals more than 500,000 gages, the replacement value of which is about $30,000,000.

Bureau Tests Industrial Gages

It is obvious that the most effective use of gages by industry can be secured only if all manufacturers and users of gages have access to the same ultimate standards. This object is promoted by the testing and certification of gages by the bureau. For such services fees are charged to cover the cost of the work.

That industry has found this service to be of real value is shown by the fact that the variety of gages and mechanical parts tested by the bureau has continued to increase since the war, and the volume of work to remain comparatively steady at about 3000 items per year. There is an increased tendency on the part of manufacturers to require careful inspection of certain gages and tools

which formerly were accepted without any question as to accuracy.

An early example of this tendency was the requirement for increased accuracy in gear hobs. Manufacturers of gears by the hobbing process began to feel the effects of keen competition with gears made by other processes, especially ground gears, and in attempting to improve the quality of their product they were inclined to require a rigid inspection of the hobs used.

Precision Gage Blocks Certified

There was also a tendency to reduce the tolerances on gages used to inspect work, which in turn increased the diffculty of determining whether a particular gage was within the tolerance specified. Accordingly, one of the first steps taken when permanent quarters were made available to the gage section was to install an insulated and thermostatically controlled constant temperature room to be used exclusively in gage testing. There also began a progressive movement in the accuracy of the equipment used for measurement of gages.

Foremost among the master gages which the bureau has tested and certified are precision gage blocks used by gage, machine tool, small tool, automobile, and many other machinery manufacturers as dimensional standards. This work is shared by the gage and interferometry sections. Sets of gage blocks are maintained by the bureau as standards, with which sets submitted for test are compared by light interference methods. These standards are checked periodically by measuring their lengths directly in terms of wavelengths of monochromatic light. For highest precision certification, a few gage blocks submitted for test are also so measured.

For more than ten years, the bureau has co-operated with the American Petroleum institute to establish and maintain standards for oil well casing threads and other screw threads for oil field equipment. The section measures and certifies master plug and ring thread gages made to represent the standards adopted. The bureau is custodian of the sets of grand master gages. Three sets of regional masters, which are used to check inspection gages, are deposited at convenient stations. These are rechecked periodically by the bureau. Thus uniformity and complete interchangeability of such threads is secured throughout the country.

Wires for measuring pitch diameters of screw thread gages are frequently measured and certified. Occasionally master lead screws for mahine tools are thoroughly investigated as to errors in the screw.

One of the functions of the gage section is to act as referee in disputes between manufacturers and purchasers of gages as to the acceptability of gages in question. The section also is called upon to an increasing extent to determine dimensions of parts of scientific apparatus such as penetration needles for determining consistency of bituminous materials, and polariscope tubes, of which hundreds of items have been tested in one year.

Aids Standardizing Bodies

The certification of gages constitutes only part of the work done by the gage section. As previously indicated, much work has been done in the development and improvement of test methods and apparatus. The section has been of considerable assistance to standardizing bodies such as the National Screw Thread commission, various sectional committees organized under the procedure of the American Standards association, and the division of trade standards of the bureau. It has conducted or assisted in a number of technical investigations which have provided data necessary for various standardization projects dealing with mechanical parts, screw threads, and threaded product and gages, and for preparation of federal or departmental purchase specifications for such items.

One of the American standards which the section has assisted in formulating is ASA B1.1-1935, Screw Threads. A project of the sectional committee which contributed toward this standard was the Screw Thread Survey, for which the threads of about 7800 sample screws, bolts and nuts were measured, gaged, and classified by the gage section. A second American standard which the section has assisted in formulating and is now helping to revise is ASA B4a-1925, Tolerances, Allowances and Gages for Metal Fits. A third is ASA B33.1-1935, Hose Coupling Screw

Before and After

Redesigning metal products for appearance has an important bearing on sales. At the left is shown the original Speed Queen washing machine, manufactured by the Barlow & Seelig Mfg. Co., Ripon, Wis., while at the right it has emerged from the hands of an industrial stylist. "In redesigning this machine," says the designer, Clement Thelander, Rockford, Ill., "the work started with the development of a new wringer and assembly. We had the assistance of a sculptor, Fred Ruppel. The work on the wringer then served as the starting point or motif which was carried on through the re-styling of the complete machine. The aim throughout the work was to develop an attractive and sturdy looking unit having the appearance of ample size. Subsequent sales justify us in believing that we were successful. And this larger volume is being secured at an increased price per unit over the previous model"

Threads, and a fourth is ASA B48.1-1933, American Standard Practice for Inch-Millimeter Conversion for Industrial Use. Representatives of the bureau and the section have served on the sectional committees responsible for these standards.

Setting Up Purchase Control Of Finish Materials

(*Concluded from Page* 33)

feet per gallon by using the following equation:

$$\frac{W}{w} \times \frac{20\text{x}24}{144} = C$$

Where W is weight of one gallon of material; w is weight of material used; and C is covering power in square feet per gallon.

If the linoleum used is some size other than 20x24-inch, substitute the dimensions in inches where the illustrating equation shows the figures 20x24. Do not use a piece of linoleum smaller than the size given, as it will decrease the accuracy of the results considerably. The material may be removed from the linoleum and it will be ready for use again after being rerubbed with linseed oil as before.

There is an instrument for measuring covering power, known as the Pfund cryptometer. This instrument can be used with fair accuracy and is completely described with photographic illustrations and full directions for use, in an excellent book which all users of finishing materials should own (*Physical and Chemical Examination of Paints, Varnishes, Lacquers, and Colors*—Gardner).

TO DETERMINE the values of any of the characteristics described above for any given material, it is recommended that duplicate determinations for each characteristic be run on the original sample submitted by the supplier, until two consecutive determinations check to within 0.5 per cent of each other. The question of tolerance limits must be settled by agreement with the supplier. Reasonable limits for each characteristic are suggested by example as follows, the example given being that of a typical lacquer, and proportionate tolerance limits should be used for other materials:

Specific gravity	1.26	∓0.03
Nonvolatile material	55.0%	∓3.0%
Viscosity	60 sec.	∓4
Covering power	345 Sq. Ft./Gal.	∓8

The above methods have been developed by the most critical laboratories in this country and are recommended by them. They are now in use to check the materials purchased by a nationally known corporation which has an enviable reputation for quality.

Welding, etc. . . .

by Robert E. Kinkead

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Ideas Are Property

A MANUFACTURER had a problem involving welding. Three vendors of welding equipment were called in to advise him what to do. Three separate and conflicting opinions were offered. In our opinion no one is to blame for such a situation. The vendors had valuable ideas which they had patented and offered for sale in the form of equipment. The ideas they had, but which they did not regard as valuable, they were perfectly willing to give away.

It would be contrary to good business policy to give away valuable ideas. Ideas are property and are so recognized by the courts. To give away an idea is in no way different than to give away a ton of steel or a bushel of potatoes.

If the manufacturer was chagrined in this case, it was because he erroneously believed that property can consist only of something tangible.

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New Perspective

IT IS a long step for the steel industry to use welding in the production of steel in view of the fact that it has been used heretofore merely as a maintenance method. Yet it is a step which the industry can and will take. Greater continuity of operation of rolling mills means lower costs.

In the field of mechanical devices, the development of flying shears and coilers forecast a general movement in the direction of greater speed and more continuity of operation. Now comes the welding method by which several coils of steel are welded together so that the finishing mills may come up to full speed because the coil is long enough to permit it. The economies are obvious.

While the welding of strip coils is important, the train of thought it has induced in the minds of production men is more important. They see the whole rolling mill setup in a new perspective. The use of short billets, slabs, and ingots is an inherent limitation to the continuity with which the rolling mills may be operated. Furnaces and handling equipment are built to handle short pieces. There are, of course, reasons for cutting billets into short lengths before they reach the furnaces ahead of the finishing mills, but there is doubt as to whether the reasons are good and sufficient.

Welding billets and slabs together, one after the other as they go into the roughing mill is not so far around the corner as to leave much doubt that the practice is on its way to accomplishment.

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Rut and Routine

A CLEVELAND store window displays many cages with gophers in them. Crowds collect to watch the gophers run in the wheels that are provided for them. A gopher in a wheel runs as hard as he can but he does not get anywhere.

But many employed engineers and production men, who are not in cages, fall into the rut of routine and, like the gopher, do not get anywhere. Few people employ more than a small percentage of their own mental powers.

Knowledge of welding has enabled a great many men to get out of the rut. If there are any limits to how far welding will be developed and applied, it is too soon to try to define them. From past experience, we know that there will be more than a thousand new applications of welding and new ideas about welding in the next twelve months. New businesses will be founded, new products developed, old products made better and at less cost, old companies snuffed out because they cannot keep up with the times.

There are vast opportunities for men in the welding field who do not wish to be like the gopher in the wheel who works hard all day but gets nowhere.

Power Drives

Nobody's Business

BECAUSE a drive is small or apparently of minor importance in the daily plant routine does not mean that it may be neglected, but often it is. Sometimes a failure here may have serious consequences or at least may cause inconvenience. Particularly is this true of the small general tools or machines which everyone uses but for which no one is responsible. Small grinders are typical tools of this class. However, when they fail because of neglect they become at once an important necessity.

Still greater danger of neglect lies in the many drives built into small fans, electric drills, recording and control equipment where the presence of the motor is hardly realized. Manufacturers of fractional-horsepower motors for such purposes realize the common neglect and provide bearings which, like the proverbial camel, go a long time between refillings.

"What is everybody's business is nobody's business," is applicable to all of these. Without the extra precautions of the manufacturer, failures would be much more common. However, attention to such drives should be made somebody's business. Since such equipment has long periods between necessary servicing some systematic follow-up should be applied to their supervision.

Even though the toolroom looks after small and portable tools, scheduling periodic servicing assures regular attention.

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Suggests "Break Pin Hub"

UNDER the heading "What Would You Do?" in this department for Dec. 23 the difficulties of driving a foundry conveyor belt which jammed frequently were outlined. At first, jamming of the belt resulted in burning it, necessitating replacement. Then multiple V-belts on short center drive were installed to supply the power. With this arrangement only the V-belts were damaged when the conveyor jammed.

Suggestions were asked on how to meet this problem, and the first to be received was that from Ralph S. Dyson, special engineer, Link-Belt Co., Indianapolis, who offers the following solution:

The problem and solution outlined, while reducing somewhat the cost of repairs and replacement on the conveyor drive, still permits much to be desired.

Specifications are not given as to the horsepower, speed and reduction of the drive from the prime mover to the conveyor headshaft, but I believe a silent chain drive could be installed and encased to protect it from the prevailing dust laden atmosphere, and the driven wheel equipped with what might be known as a break pin hub (see diagram below).

This driven unit would consist of a silent chain wheel to run loose on the shaft with a hub section separate, bored, keyseated and setscrewed to fit the shaft. Holes would be drilled through the hub section and through the hub of the driven wheel, in which should be inserted pins notched for the peak load which is encountered.

When the peak load was applied by the jamming of the conveyor a pin between the driven wheel and the hub section would shear, thus damaging nothing but the drill rod pin which could be replaced in a short time for a few cents.

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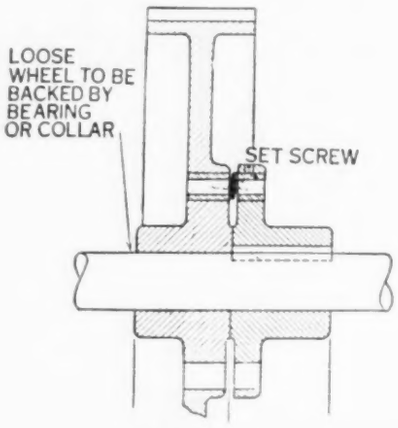
Penny Wise

HOW much does machine time cost when the machine is down for repairs? Few machines are worth as little as $1 per hour; many machines are worth several dollars per hour. In addition, if the enforced idleness interrupts a scheduled delivery the loss may represent much more. Therefore, it is penny wise to install in the drive low-cost equipment which is liable to frequent interruptions. In most cases the repair part is the least of the expense.

For example, starting equipment on a number of individually driven machine tools failed about once in two years, interrupting operation for several hours while a part costing less than a dollar was replaced. In this case the annual expense, including labor, repair part and idle machine time was about twice the original cost of the low-priced starting equipment.

When this was replaced with a higher grade starting unit of entirely different design which was constructed to eliminate the cause of failures, the decreased idle expense and maintenance paid for the more expensive equipment in about two years. Where production equipment is scheduled to meet the demands of other machines any part of the drive which regularly interferes with meeting this schedule may be doubly expensive when not the best obtainable.



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Installing Variable Speed

VARIABLE-SPEED transmission recently was applied to one of a group of machines driven from a lineshaft in a somewhat unusual manner. Available space did not permit floor mounting. As this was the end machine of the group, the lineshaft was cut in two with a hacksaw, a pulley and belt connected the motor-driven section of the lineshaft to the input shaft on the variable-speed unit which was mounted on the ceiling. Another belt and pulleys connected the low-speed or output shaft of the variable speed unit to the cut-off section of the lineshaft.

This necessitated adding an extra hanger and bearing instead of a countershaft, since the transmission unit could not be mounted where it could drive down to the machine. The two pulleys and belts would have been necessary in any mounting. Remote control, mounted at the machine, permits the operator easily to obtain any speed desired.

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Mounting Unit Motors

WHEN adapting a machine to individual drive the problem of mounting the motor is often an expensive item. In one plant where the machines were changed to individual drive this item, including the framework for mounting electrical control equipment, but not wiring expense, amounted to about $90 per machine.

Wherever it is possible to set the motor on the floor alongside and drive up to the machine pulley, this item of expense is usually the lowest

of any method. However, floor mounting is open to the objection that the motor is exposed to dust and dirt and especially to falling turnings or shavings and oil splashing, which may cause trouble in the case of direct-current or open motors. Such mounting is likely to result in extra maintenance.

Ceiling mounting is in most cases next least expensive and is generally necessary where countershafts are required.

Floorstands or frames attached to the machine at least partially overcome the objections to floor mounting but are considerably more expensive. However, a good welder—and most modern plants of any size require one or more such men in their maintenance force—usually can build such a structural steel mounting either in the shop or at the machine, often without even a rough sketch and at far less expense than by any other method of fabrication. Perhaps less steel might be required if a draftsman designed the frames but this would cost more than the few pounds of angle iron saved. A good welder is an artisan and takes pride in a neat, good looking job, so no objection should be raised from that angle.

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When considering the cost of a power drive do not overlook annual fixed charges on the installed cost of all electrical and mechanical elements in the drive, including wiring and control.

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In the selection of a lubricant, consider surrounding temperatures of bearings not only when idle but also when operating. Sometimes the temperature range extends over 100 degrees or may go as high as 200 degrees maximum. Consult a reliable manufacturer of lubricants for recommendations for such extreme conditions of operation.

Transmission Belt Improved By Continuous Vulcanizing

Transmission belting manufactured by the Boston Woven Hose & Rubber Co., Cambridge, Mass., as a result of the development of a new and original rotary type of press, now is being vulcanized continuously in place of in 30-foot lengths as heretofore. The new method is said to make possible thorough stretch and pressure control, thus insuring uniform thickness. The new process is said to prevent press overlaps and press marks and also to prevent overcure or undercure at any points. As a result, the belt has a higher coefficient of friction and is said to give improved performance.

Welding Repair Saves Bridge Badly Damaged by Smoke Corrosion

SUBSTANTIAL savings recently were effected by the city of Cleveland when badly corroded stringers of a 50-year old bridge were strengthened by arc welding.

The bridge, which spans the Erie railroad tracks at east Thirty-fourth street, Cleveland, was damaged by heat and corrosive elements discharged from locomotive smokestacks. The stacks clear the bridge stringer by only 6 inches and the corrosive agents had practically eaten through the stringers.

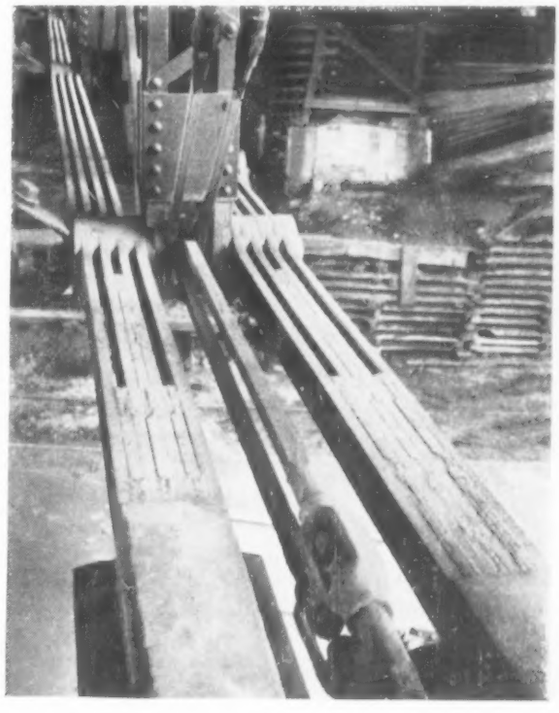
By the electric arc welding process it was possible to repair the bridge without practically dismantling it and erecting extensive falsework beneath to support the structure while repairs were in progress. The accompanying illustration shows how repairs were made to the stringers.

Old, badly corroded portions of the stringers were chipped away to expose sound metal. Lengths of steel plate then were inserted between the stringers, welded in place and the openings filled in with weld metal. After welding up the stringers, smoke plates were welded to the top and bottom to protect the stringers from further corrosion. A total of 500 feet of welding was required. It included 200 feet of overhead welding (on the underside of the stringers), 200 feet of downhand welding (on the upper side), and 100 feet of miscellaneous work. All welding was done by the Ohio Machine & Boiler Co., with electrodes and welding machines supplied by the Lincoln Electric Co. Cleveland.

Work on the bridge was seriously handicapped by passing trains. In order to prevent accidents, it was necessary for one man to stand by to warn welders (who did the work from ladders) of approaching trains. So great was the force of locomotive exhausts that welding cable, wire brushes and other equipment had to be tied down. In spite of these obstacles, the bridge was open to traffic at all times and the work completed ahead of scheduled time.

New Farm Light Plant, Hammer Mill Announced

Cushman Motor Works, Lincoln, Nebr., is announcing a new light plant consisting of a Cushman engine, generator and storage battery suitable for a farm lighting system. Strut-type pistons in the engine are of aluminum alloy and the valves of silchrome steel. The 750-watt generator rests on a one-piece cast iron base. The Cushman company also is manufacturing a new hammer grinder with vertical feed screen.



BRIDGE stringers repaired by arc welding after they had become corroded by smoke from locomotive exhausts

Progress in Steelmaking

Simplifies Scrap Breakage

Steel, which overflows from the 150-ton ladles into the slag pots at an Ohio steelworks, and later is removed in the form of a conical-shaped mass, usually is in too large a chunk to be charged through the doors of any of the open hearths. Because of the high cost of gas cutting this recovered metal to chargeable sizes, which frequently amounted to $18 per ton, the scrap as removed from the pot is piled in the scrap yard until such a time as a roof on one of the furnaces has to be replaced. Before the new roof is installed, as many of the recovered chunks of ladle scrap as melting conditions will warrant are charged through the top. At present, however, the management is having a cinder pot made with a wedge-shaped partition cast in the bottom for the purpose of providing a wide nick or notch in the mass of overflow metal and thus facilitate breakage when the chunks are subjected to the action of the ball at the scrap drop.

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Discloses Cracks or Flaws

Washing ladle trunnions with kerosene usually discloses any cracks or flaws which otherwise cannot be seen by casual observation. Large cracks in ladle trunnion castings in many cases can be traced to hot slag running over the lip of the ladle onto the trunnion, according to investigations conducted at an open-hearth shop.

Tractor Safeguards Steel Company's Coal Stores

Coal stores of the Algoma Steel Corp., Sault Ste. Marie, Ont., are protected against oxidation and spontaneous combustion in an effective manner. A diesel tractor equipped with a bulldozer levels off layers of the coal. Then, pulling a water-ballasted roller, 6 feet wide and 31.9 inches diameter, the diesel compacts each layer before the next is spread over it. The tractor, manufactured by the Caterpillar Tractor Co., Peoria, Ill., is reported to consume only 1.2 gallons of low-cost fuel oil per hour. The total cost for this operation, including labor, is $1.26 per hour

Call System Is Effective

Noises, which normally interfere with regular communication, will not carry over a newly announced intercommunication system. A party can call from any point on this system to any other point in any mill department and get a reply instantaneously. The party answering can respond from a distance of 10 to 40 feet from the speaking unit, in a normal voice and without operating a switch. The system can be extended along cables for distances of 12 miles or more.

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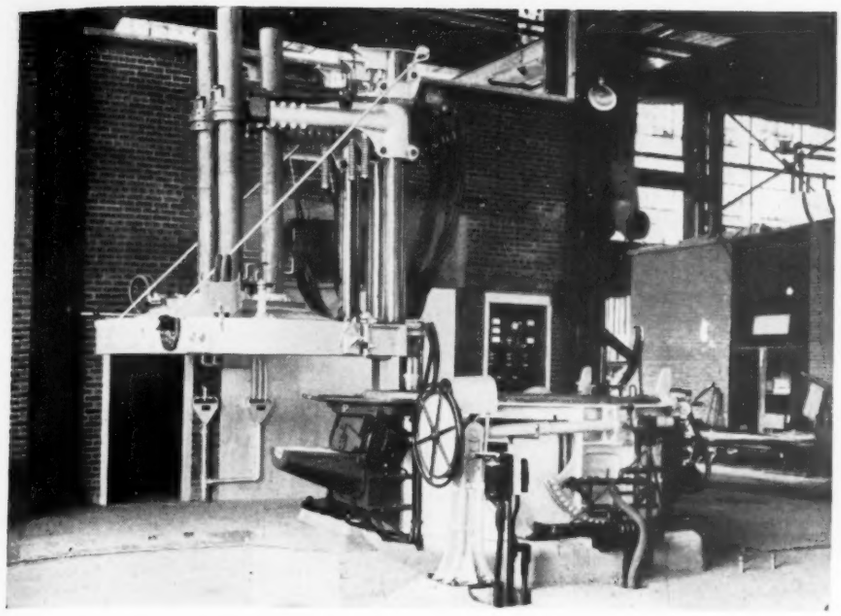
Assures Uniform Movement

Maintaining continuous movement of strip through pickling tanks now is accomplished by an electric control system which permits a predetermined rate of travel through the acid baths and provides fresh coils by shearing off the front end of a new coil and the rear end of the old coil and stitching them together without interruption of the movement of the strip in transit. At the delivery end the stitch is sheared out and the strip wound into a coil without stopping the oncoming material.

• • •

Removes Oil from Surface

Research has culminated in the development of a detergent which removes drops of oil from the surface of strip and allows the pickling solution to react on the scale beneath. The product is highly effective in sulphuric acid solutions maintained at high temperature and with a high percentage of acidity; it is specially adapted for use in continuous picklers where the strip travels from 20 to 80 feet a minute through the various vats. On the basis of 1 quart to 1000 pounds of acid the cleanser produces a white clean surface on the metal. The compound also can be used for sheets and strip pickled in various type mechanical agitated equipment.



Installation of a top-charge electric furnace showing the roof swung aside ready for the charging operation

Top-Charge Melting Unit Handles Bulky Scrap

CLOSE observance of the cost factor in the production of electric furnace steel has led to widespread inquiry and more numerous subsequent installations of the top-charge type designed furnace. Though the basic idea of the top-charge electric furnace goes back to its patent date in 1925, it has only been since 1932 that a growing volume of this type of melting unit has come to be used.

The advantages claimed for this type of design not only include the wider use of bulky remelting scrap, many sizes of which cannot be charged through a side-door type electric steel furnace, but a substantial saving to the operator in charging time and labor, and power, electrode and refractory costs.

Many Furnaces Installed

These advantages, all inherent in the top-charge furnace's rapid and efficient operation, have led to several recent installations which are meeting with satisfaction in operation. Josslyn Mfg. Co., Ft. Wayne, Ind., has just installed two 10-ton furnaces of this type; Burlington Steel Co., Hamilton, Ont., one 5-ton furnace; International Nickel Co., Huntington, W. Va., two 15 to 20-ton furnaces, and an unnamed Eastern concern, two 5-ton units. This type of furnace was invented and patented by the Pittsburgh Lectromelt Furnace Corp., Pittsburgh.

The main difference in the top-charge type furnace is essentially in that the roof operates in a horizontal plane instead of tilting. It is claimed that strains, as in the tilt back roof type thus are avoided. The roof-lift-swing-aside movement is made by a powerful ram from the stationary cylinder, the ram having a tapered and keyed head.

Oil pressure for the lift-and-swing-aside movement usually is furnished by a motor-driven pressure pump, although hydraulic pressure available in many large steel mills also may be used.

In the case of oil pressure, however, this is drawn from its associate reservoir tank for operating the heavy double anchor lift and swing aside cylinder. This mechanism is protected properly by sequence movement interlocks.

According to the accompanying illustrations, the heavy roof-lifting cylinder is stationary and separate from the furnace shell. The aforementioned ram moving from the stationary cylinder and effecting the roof lift movement is integral with a swinging cam roller and operates as follows:

Pivoted on Roller Bearings

As soon as the vertical lift of the furnace roof has been made, the cam mechanism automatically begins to impart a smooth rotating action to the roof superstructure assembly. The use of heavy roller bearings has been made for the piston head of the ram to pivot on.

At the time oil pressure is applied in the cylinder directly beneath the piston head, the lift ram is raised quickly so as to engage the match-machined receiving socket in the steel column eye casting. This casting ties all the roof and superstructure parts together so that they function as a unit.

Suitable auxiliary guide parts, which will insure the necessary rigidity for swinging clear of the furnace after slight lifting, are employed as the ram head enters its eye socket.

Sequence movement interlocks on the top-charge equipment are so interlocked that the furnace's main switch necessarily must be open while the top-charge mechanism is in use. Furnace is so designed that melting power cannot be applied until the roof is returned to its normal posi-

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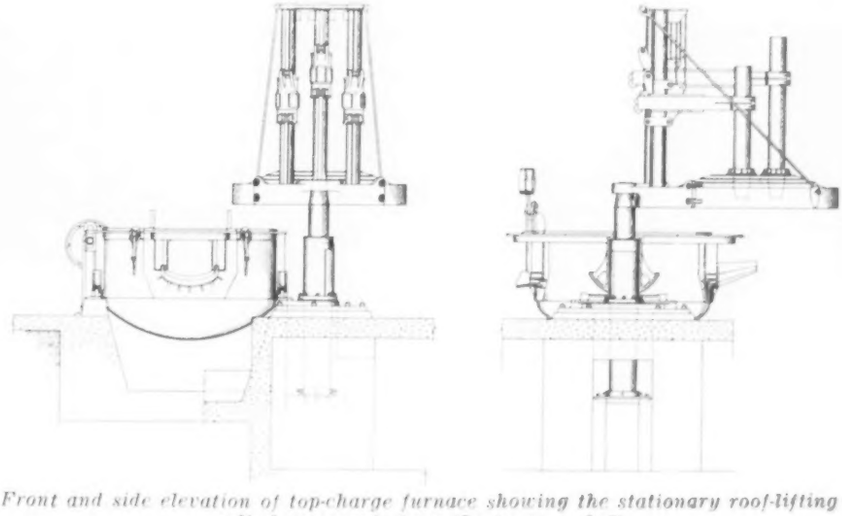
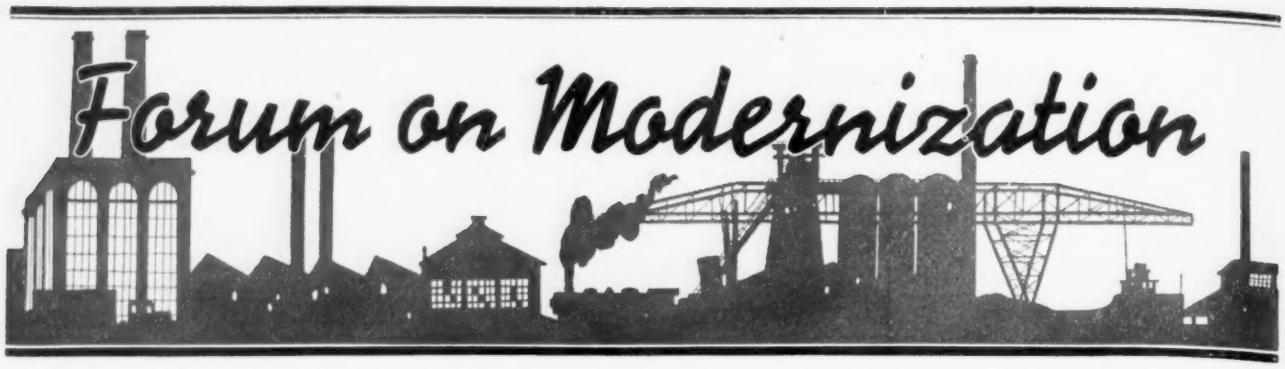


Front and side elevation of top-charge furnace showing the stationary roof-lifting cylinder separate from the furnace shell



Calculating Economic Advantages of Replacing Obsolete Equipment

A MANUFACTURER in California, operating various types of machine tools, has asked the following question concerning obsolescence and equipment replacement:

> Have you any information as to when it becomes profitable to replace worn machinery?
>
> For example: Suppose a used machine with a book value of $4000 carries a fixed charge, i.e. depreciation, rent, taxes and insurance to the amount of $600 per year, with an upkeep charge of only $20 per year. The overhead rate placed upon the machine is $1.75 per hour. The machine runs 1800 hours out of a 2000 hour yearly capacity. The burden thus earned for the year is $3150.
>
> A new machine to replace the old one costs $9000. What increased capacity would the new machine need to produce to warrant the investment of $9000?

This problem of figuring in dollars and cents the economic advantages of a new machine is one deserving the attention of all users of machine tools. Formulas have been worked out for determining obsolescence, but in preference to repeating these, STEEL asked M. E. Lange of the Warner & Swasey Co., Cleveland, to comment on the above query. Mr. Lange reviews the matter as follows:

IN THE light of experience with the old machine, and assuming realization of the depreciated book value of $4000 upon its resale, it would be possible to realize a net profit of 20.9 per cent on the $5000 additional investment if the new machine were to reduce production time 30 per cent.

In order to illustrate a working case, we will take a piece turned out in 10 minutes on the old machine, with direct labor at 75 cents an hour and the overhead (including depreciation, taxes, etc.) $1.75 as specified. The average cost of such a piece has been 41 cents. If this piece is produced with the new machine in 7 minutes, the cost will be reduced to 29 cents, for a saving of 12 cents per piece.

The total production per month with the new equipment, assuming 23 working days of eight hours each, will be 1577 pieces. The saving per month, therefore, will be 1577 × 12 cents, or $189.24. Inasmuch as the new equipment, like the old, probably will be in operation only 90 per cent of the time the usable savings per month must be reduced 10 per cent to $170.32.

At this rate the new equipment will pay for itself in 29.4 months. This is computed by dividing the net cash investment ($5000) by the usable savings per month ($170.32).

The usable savings over a period of 12 months will be $2043.84. If we allow 20 per cent for depreciation on the net cash investment of $5000 the net profit remaining will be $1043.84 or 20.9 per cent per annum.

Reduction in time per piece from 10 minutes to 7 minutes brings

(*Please turn to Page* 72)

Equipment Replacement Statement

Average former cost: 10 minutes (per piece) x 4.1c (with direct labor at 75c and overhead at $1.75, a total of $2.50 per hour, or 4.1c per minute).		$0.41
Average cost with new equipment: 7 min. (per piece) x 4.1c		0.29
Savings per piece		0.12
Production per month with new equipment: 60 min. (per hr.) x 8 hrs. (per day) x 23 (working days) / 7 minutes per piece (with new equipment)		= 1577 pieces
Total savings per month will then be: 1577 (pieces per month) x 12c (savings per piece)		$189.24
If new equipment is kept busy only 90 per cent of the time, deduct 10 per cent for idle time		18.92
Value of usable savings per month		$170.32
Investment in new equipment	$9000.00	
Less resale value of old equipment	4000.00	
Net cash investment in new equipment	$5000.00	

The new equipment will pay for itself in:

$$\frac{5000 \text{ (net cash investment)}}{170.32 \text{ (usable savings per month)}} = 29.4 \text{ months}$$

Net profit return per year will be:	
170.32 (usable savings per month) x 12 months	$2043.84
Less 20 per cent depreciation on $5000 (net cash investment)	1000.00
Net profit per year after depreciation	$1043.84

Rate of net profit will be:

$$\frac{1043.84 \text{ (net profit)}}{5000 \text{ (net cash investment)}} = 20.9 \text{ per cent}$$

Increased production is $\frac{10-7}{7} = 42.86$ per cent.

Reduction in production time is $\frac{10-7}{10} = 30$ per cent.

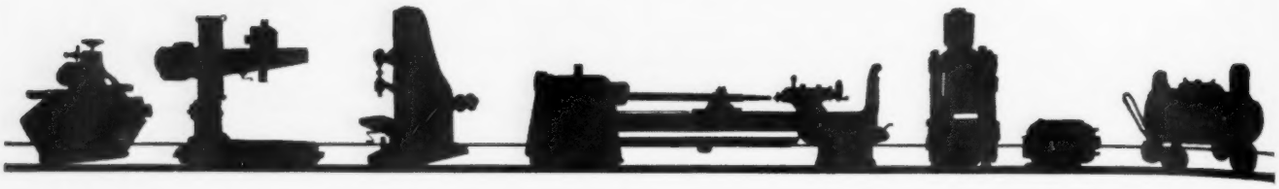
● The widespread use of Nickel Alloy Steels for highly stressed automotive parts testifies to the remarkable toughness and dependability of these steels. They not only reduce breakage and wear under ordinary service conditions but successfully meet the emergency demands of abnormal road conditions.

NICKEL ALLOY STEELS

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET, NEW YORK, N. Y.

New Equipment



Open-Back Inclinable Press—

Niagara Machine & Tool Works, 637-697 Northland avenue, Buffalo, announces the addition of a new

Master series No. A-4 press developed by Niagara Machine & Tool Works

master series No. A-4 press to its line of inclinable open-back presses. This new unit, shown herewith, has a 4-inch diameter forged and ground main shaft. The machine is designed for strength and rigidity and includes a quick acting six-point engagement clutch, new type slide with breech block die clamp and equal support for die from center to front and center to rear, double V-gibs, motor drive on top, self-contained antifriction back gear, compensating brake, and one-man inclining device equipped with antifriction bearings.

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Oil-Resisting Pneumatic Hose—

Republic Rubber Co., Youngstown, O., is introducing a new air hose designed especially to overcome the deteriorating effects of hot oil from compressors. The tube is made from a compound similar to that employed in oil conducting hose. In addition, the hose possesses resistance to heat, high pressures, abrasion, the cutting effect of sharp rock and exposure to sun and weather. Strength has been obtained without imparing flexibility by constructing the plies from a specially twisted cord which is thoroughly impregnated with a new tenacious rubber compound. This also increases the bursting and working pressures, and results in greater resistance to shock and abuse. All construction details of the new hose have been so balanced and engineered as to result in strength without excess bulk or useless weight.

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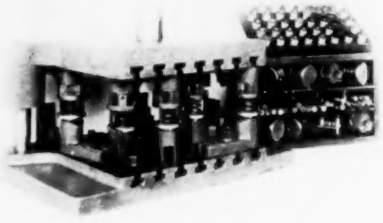
Perforating and Notching Dies for Sheet Metal—

S. B. Whistler & Sons Inc., 752-4 Military road, Buffalo, has placed in production adjustable perforating and notching dies for sheet metal. Center distance can be set as close as 1½ inches. The company declares that in using its universal perforating die, shown in the accompanying illustration, with two standard punch and die retainers and one special die retainer of larger diameter, it is possible to set these units in about twenty minutes, creating a progressive perforating and blanking die for producing washers. The stripper unit is so designed that it is possible to punch up to and including ¼-inch stock and properly strip the material from the punches. Along with various perforating dies, the company also makes corner notching dies of various shapes, which also are adjustable for various depths of notches. Where a group of holes similar to a set of four or five holes used for hinges are required, the company makes this unit complete as a cluster die so that in moving it on a T-slotted die bed the entire group of holes is constant.



Whistler universal perforating die

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Tank Supports—

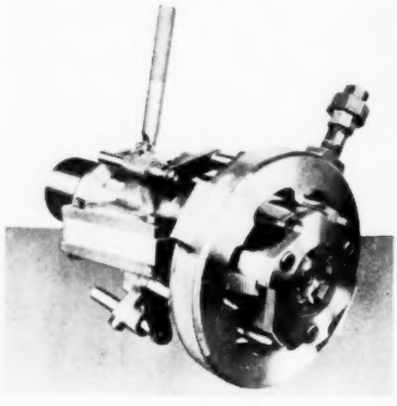
Templeton, Kenly & Co., 1020 South Central avenue, Chicago, is marketing adjustable tank supporting jacks available with drop forged and cast saddles. A range of sizes is available to meet such requirements as adjustability for gravity flow, etc. The new design of these units has effected a reduction in installation time. They are finding wide use with tanks in the oil, food product, dairy, water softener and boiler fields.

♦ ♦ ♦

Oil Type Trip Ring for Collapsible Taps—

Landis Machine Co., Inc., Waynesboro, Pa., is bringing out an oil type trip ring for collapsible taps. When tapping any threads, particularly long threads of large diameters in steel, it is essential to maintain an ample supply of lubrication to dissipate heat and wash away chips. To insure a sufficient supply of lubricant for its line of collapsible taps, the company has developed this oiling type of trip ring to replace the conventional type of ring usually employed on a collapsible tap. The accompanying illustration shows one of these rings applied to a 6-inch style LM receding chaser collapsible tap.

The ring consists of a hollow



Oil type trip ring applied to Landis 6-inch collapsible tap

Here's the best protection yet for pickling equipment. It's a new marvel of maintenance economy

P. I. C.

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STOPS CORROSIVE VAPORS

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FACTORY AND GENERAL OFFICES . PITTSBURGH, PENNSYLVANIA

BRANCHES: BOSTON • BUFFALO • DETROIT

housing with steel plates mounted on the front and the back, thus forming a reservoir for holding the lubricant. On the smaller sizes of rings the housing is made of cast iron and in order to reduce the weight the housing for the larger rings is made of aluminum. The front ring which contacts the work to effect the receding and collapsing action of the tap is made of steel and case carburized to resist wear. Holes are placed diagonally in the housing through which a stream of oil is forcibly directed upon each chaser throughout the entire length of the cut, thus insuring ample lubrication at the point where it is needed.

A supply pipe with union connection is provided for attaching the supply hose. The housing of the trip ring remains stationary while the front and back plates will turn with the tap if the tap must revolve for tapping the thread. These rings are available for use with Landis style LM receding chaser and style LT collapsible tap 6-inch size and larger.

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Air Separator—

Motor Improvements Inc., 365 Frelinghuysen avenue, Newark, N. J., recently brought out an improved air separator which absorbs fumes and

Purolator air separator absorbs fumes and removes oil and water moisture from air so that pure breathable air is delivered to operator's mask

removes as well the oil and water moisture from compressed air so that pure breathable air is delivered to the operator's mask as he performs sandblasting operations. Compressed air enters the separator case, striking the inside walls of the case and the external surface of the filtering element. The greater part of the separation takes place while the air is passing through the filtering slots in the filtering element. The separator, shown herewith, is so arranged that the filtering unit may be removed for refilling as well as for cleaning.

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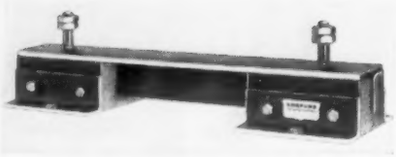
Vibration Damper—

Korfund Co., 48-15 Thirty-second Place, Long Island City, N. Y., is introducing a type T Seismo-Damper



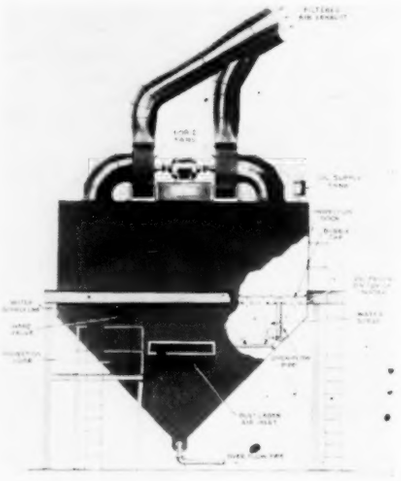
Korfund type T Seismo-Dampers joined by extended T-iron

in sizes from 100 to 2500 pounds capacity. Strength, compactness and a high degree of vibration isolation for medium and light machinery have been achieved in the development of this unit. In the accompanying illustration two dampers are joined by an extended T-iron to provide continuous support to eliminate any undue bending stresses on machine frame. The machine is directly supported by the T-iron separated from a base of two angle irons by natural cork or other insulating material. The angle irons are firmly connected by bolts passing through the isolating material and T-iron, but not touching it. Before installation these bolts are adjusted to produce a precompression of the isolating material to suit the machine load. Further adjustment can be made easily after installation.

• • •

Dust Collector—

C. O. Bartlett & Snow Co., Cleveland, is marketing a new dust collector in which dust-laden air is drawn through ducts to an equalizing chamber. It then is passed upward through bubble caps into a water bath which is covered with an oil carpet, and is discharged from the upper chamber with a fan. The larger dust particles are removed in the water. Fines are trapped in the oil carpet. The unit,



Dust collector built by C. O. Bartlett & Snow Co. in a range of sizes

shown herewith, has no moving parts except the fan, is compact and may be suspended from the building members. Water is piped in one end and out of the other. Operation of the filter is entirely automatic. All-steel construction and the entire absence of flammable materials commend its use on a wide variety of materials. Standard sizes range from 1000 cubic foot machines to those capable of handling 35,000 cubic feet a minute.

• • •

Adjustable Oiling Device—

National Industrial Products Corp., Wilkinsburg, Pa., with general offices in Cleveland, announces the development of an adjustable

Adjustable universal type Oilit added by National Industrial Products Corp. to its present line of vacuum type constant level oilers

universal type Oilit as an addition to its present line of vacuum type constant level oilers. The unit, shown herewith, is adaptable to a wide variety of equipment. It permits adjustment of the oil level in bearings after the installation has been completed. The principle of constant level lubrication combined with the visible oil supply has done much to reduce maintenance costs on electrical equipment of all types, the company declares. This new development simplifies the process of application.

• • •

Fuel Oil Viscosity Indicator—

Sterling Engine Co., 1252-1274 Niagara street, Buffalo, is marketing an instrument, shown on page 50, which constantly indicates the viscosity of fuel oil passing to burners. Economy and efficiency in combustion are principal advantages to be gained from its use. With the Flo-Rator, as it is known, installed, the combination of the best flame and smoke conditions is first determined. The red hand of the instrument then is set at the corresponding desired viscosity as indicated on the gage, and from then on any change in viscosity will be shown on the gage and can be corrected either

Comments on the 1936 "Yearbook of Industry" issue of STEEL

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"The January 6th issue of STEEL is the most magnificent in its line I have ever seen; its preparation and presentation reflect much credit upon you and your staff. Up to now, I have felt inclined to regard FORTUNE as the "high spot" in printing and illustrating, but you have outdone even that publication. Your graphs are unusually good - more especially the one on page 200. Not only is it illuminating; it's a wonderful piece of work."

›››

"Doubters of the stride of industry might do well to take a look at the annual number of the magazine STEEL. It takes 372 pages of colorature and of black and white to tell the story.

This special issue carries the title of "Yearbook of Industry" on its jacket design. We would call it the most striking exhibit of recovery on the way appearing to date."

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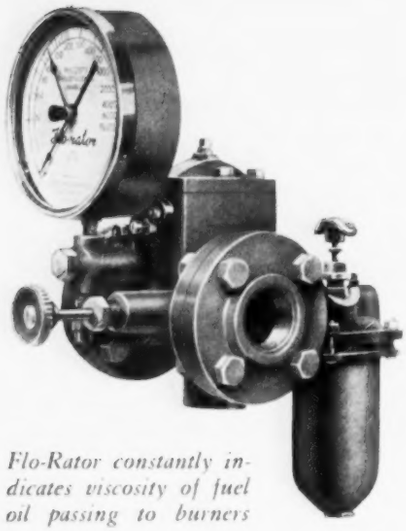
May we suggest a careful study of the January 6th issue of **STEEL**

Your comments, critical or otherwise, will be appreciated.



Flo-Rator constantly indicates viscosity of fuel oil passing to burners

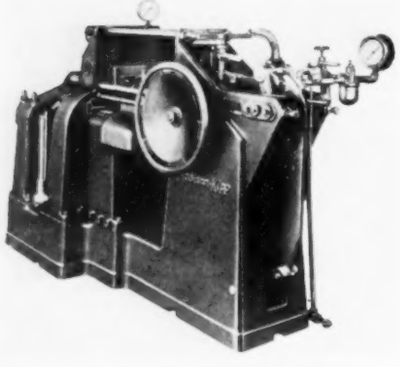
by manual control or by automatic valve control of the steam, heating the fuel, so that the steam in the fuel oil heaters always will maintain the predetermined desired viscosity. Additional advantages claimed for the instrument include reduced carbonization of burners, reduced soot accumulations on the fireside of the boilers, reduced wear on refractory material, elimination of carbon deposits in fuel oil heaters, etc.

• • •

Die Casting Machine—

Madison - Kipp Corp., Madison, Wis., has introduced an intermediate size die casting machine which will handle standard die casting alloys in zinc, aluminum, lead or tin. Standard equipment includes an air pressure gooseneck, but a plunger type gooseneck may be applied when specified. The effective capacity of the standard air gooseneck is 5 pounds in zinc alloy. The metal pot capacity is 300 pounds of zinc alloy.

New features include a mechanism for quickly moving the complete furnace assembly and for changing pots and goosenecks when a change in metal specifications is necessary.



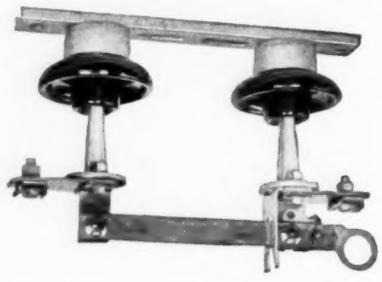
Madison-Kipp die casting machine is equipped with safety features

The standard, automatic core pulling mechanism may be applied to the machine so that all cores are placed and withdrawn as the dies open and close. Ejection of castings is automatic with the opening of the dies.

• • •

Light-Duty Outdoor Disconnecting Switches—

General Electric Co., Schenectady, N. Y., is marketing new types FD-102 and FD-103 light-duty outdoor hook-operated disconnecting switches. The latter type, for underhung mounting, is shown herewith. They are available in 7500S and 15,000S volt, 200 and 400-ampere ratings, and are arranged for either vertical or underhung mounting. The galvanized channel base is provided with slots to make it suitable for pole-top cross arms. Contact is of tongue construction, and the blade is of the double type, fabricated from hard drawn copper. A simple effective blade latch assures latching



G-E Outdoor disconnecting switch for under-hung mounting

in the closed position. Terminals are of the clamp type, eliminating the necessity of soldering connections.

Trade Publications

Blast Room Equipment—Pangborn Corp., Hagerstown, Md. A bulletin embracing a modern blast cleaning room, with diagrams and description.

Dippers—American Manganese Steel Co., Chicago Heights, Ill. A bulletin listing and illustrating features of the AMSCO renewable lip dipper.

Heaters—Worthington Pump & Machinery Corp., Harrison, N. J. A leaflet, No. W-210-B17 358, on deaerating feedwater heaters, containing views, weights, and uses of various types.

Chains—International Chain & Mfg. Co., York, Pa. A catalog, No. 20, illustrating and describing the various types of chains manufactured by the company.

Lubrication—Tide Water Oil Co., 17 Battery Place, New York. Two 14-page booklets, one a survey of green cast greases showing their history, nature, general uses and applications, with description of some field results; the other a discussion of developments in hand and pressure application, in regard to roll neck lubrication, with recommendations for use and listing of products.

Welding—Smith Welding Equipment Co., Roslyn, Pa. A catalog section, No. AWP16A, containing information, prices, etc. pertinent to Amcoweld arc welding accessories.

Nickel-clad Steel—Lukens Steel Co., Coatesville, Pa. A 24-page booklet, form 18-AV, describing applications, processing, and manufacturing of this type of steel, including prices and standard extras.

Sump Pumps—Deming Co., Salem, O. Bulletin No. 4600, covering information on vertical sump pumps, with applications and details of construction, installation and performance tables, specifications and illustrations.

Arc Welders—Hobart Bros. Co., Hobart Square, Troy, O. A 39-page booklet on processing, planning and featuring of this company's products, and a trip through the factory by illustrations, showing engineering and manufacturing methods.

Power Plant Devices—Yarnall-Waring Co., Chestnut Hill, Philadelphia. Bulletin EJ-1905, containing information on all-steel cylinder guided expansion joints, with prices and weights, dimensions, and typical installations.

Friction Material—Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J. A catalog with technical descriptive data on Condor types, friction material requirements, installation charts and list prices.

Gear Generators—Farrel-Birmingham Co. Inc., 344 Vulcan street, Buffalo. Catalog No. 440, containing applications to Farrel-Sykes gear generators, design and construction, developments and processing; sizes and capacities, operation and use.

Worm Gears—DeLaval Steam Turbine Co., Trenton, N. J. A bulletin by M. M. Wills, company engineer, covering design, available ratios, efficiencies, lubrication requirements, installation and standard formulas according to which such gears are now rated.

Machine Gas Cutting—General Welding & Equipment Co., 28 Carleton street, Cambridge, Mass. A booklet on Type K stationary automatic shape cutting machines, including operation, capacity, drive, carriage and suspension system, controls, machine parts and equipment furnished.

Electric Tools—Dumore Co., Racine, Wis. Two circulars: One covers the Vari-speed flexible shaft tool, emphasizing the adjustable electric governor; the other describes the new No. 44 Dumore tool maker precision grinder, with facts concerning its equipment and range of its work.

Bearings—S K F Industries Inc., Front street and Erie avenue, Philadelphia. Two booklets: No. 232 30S on the housings available for fan and blower applications for new production and change-over; No. 233 30S, analysis of SA type pillow block used in conjunction with spherical roller bearings.

Steel Rate Up, Despite Drift in Motorcars

Little Effect So Far From AAA Decision; More Activity In Heavy Products

MARKET IN TABLOID

DEMAND . . . *Rapid rise from holidays, but not up to December level.*

PRICES . . . *Most finished steel products steady. Scrap strong.*

PRODUCTION . . . *Ingots up 2 points to 51½ per cent.*

SHIPMENTS . . . *Merchant pig iron 60 per cent of December's. Steel picking up.*

STEEL demand has recovered rapidly since the holidays, gains are well distributed, and comparatively little effect on the agricultural markets has yet developed from the downfall of the AAA.

The AAA has been a strong factor in bolstering sales of iron and steel products, such as implements, tractors and automobiles. The general opinion is that unless farm prices collapse, which at the moment appears improbable, and if consumption of grains and meats increases with general business improvement, farm income still will remain sufficiently high to neutralize loss of the government's checks. Also, the soldiers' bonus is expected to reinforce purchasing of many consumer goods.

In implement and tractor production so far there has been no slackening; in fact an actual increase in steel releases is reported. Assembly of a little less than 350,000 cars is scheduled for this month, or 10 to 15 per cent below December. The industry benefited through late fall production of new models, when the farm market, which takes about one-fourth the output, was at its height. New steel commitments by automobile manufacturers are lighter and buying is restricted to earlier needs than formerly.

Steelworks operations last week advanced 2 points to 51½ per cent. Chicago was up 4½ to 51½; Pittsburgh 2 to 40; eastern Pennsylvania 1½ to 35½; New England 8 to 83. Birmingham dropped 15 to 41; Cleveland 12 to 60; Wheeling 2 to 68, and others were unchanged.

Producers estimate pig iron shipments this month will be 60 per cent of December's, so that a decline in production seems inevitable. Consumers' stocks are expected to be liquidated by mid-February to permit a resumption of normal buying. Scrap is moving slowly, but significant of general market strength, STEEL's scrap composite is unchanged for the fourth consecutive week, suggesting fresh demand may again lift prices.

More than 12,000 tons of plates were placed for oil tank and refinery development, and bids were taken by Humble Pipe Line Co., Houston, Tex., for a 200-mile 8-inch welded gasoline line in that state, one of the largest projects of its kind in several years, requiring an estimated 10,000 tons of steel. At New York, 25,000 tons of plates are to be purchased shortly for tank and cargo ships recently awarded.

Los Angeles has opened bids on 44,000 tons of welded steel pipe; San Francisco is in the market for 9500 tons, and a pipe line at San Diego, Calif., requires 3000 tons of steel.

Structural shape awards increased to 24,216 tons, including 4500 tons for Inland Steel Co.'s new open-hearth building at Indiana Harbor, Ind. Bids on 3000 tons for 17 Illinois bridges have been rejected on grounds that prices are too high. Secretary Ickes has backed down on his complaint against uniform prices submitted for 3600 tons for a Miami, Fla., dock, and instead of concluding the award to the purchaser with the longest freight haul has gone back to his original distribution to four mills.

The Bessemer & Lake Erie and Union railroads, United States Steel Corp. subsidiaries, are taking bids on 3000 freight cars and 25 locomotives. Lehigh Valley contemplates construction of 250 coal cars and rebuilding 750. Santa Fe has purchased 17,800 tons of track fastenings, and New York Central is expected to issue an inquiry this week for 35,000 tons of rails.

Final figures on December ingot production show a daily average of 123,272, up 1.6 per cent —exceeding even that in December 1929, and largest for the month since 1928, with 160,728 tons. Total for December was 3,081,807, compared with 3,153,247 in November. The year's output was 33,425,576 tons, a gain of 30.6 per cent.

STEEL's iron and steel price composite is up 2 cents to $33.33, on some adjustments in scrap, while the finished steel index remains $53.70.

COMPOSITE MARKET AVERAGES

	Jan. 11	Jan. 4	Dec. 28	One Month Ago Dec., 1935	Three Months Ago Oct., 1935	One Year Ago Jan., 1935	Five Years Ago Jan., 1931
Iron and Steel	$33.33	$33.31	$33.31	$33.31	$32.84	$32.58	$31.69
Finished Steel	53.70	53.70	53.70	53.70	54.00	54.00	49.30
Steelworks Scrap	13.12	13.12	13.12	13.17	12.72	12.03	10.49

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Jan. 11, 1936	Dec. 1935	Oct. 1935	Jan. 1935
Steel bars, Pittsburgh	1.85c	1.85	1.85	1.80
Steel bars, Chicago	1.90	1.90	1.90	1.85
Steel bars, Philadelphia	2.16	2.16	2.16	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts	2.40	2.40	2.40	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$30.00	30.00	28.00	28.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	28.00	28.00
Billets, open-hearth, Pittsburgh	29.00	29.00	27.00	27.00
Wire rods, Pittsburgh	40.00	40.00	38.00	38.00

Pig Iron

	Jan. 11, 1936	Dec. 1935	Oct. 1935	Jan. 1935
Bessemer, del. Pitts.	$20.8132	$20.8132	$19.8132	$19.76
Basic, Valley	19.00	19.00	18.00	18.00
Basic, eastern, del. eastern Pa.	20.8132	20.8132	19.8132	19.76
No. 2 fdry., del. Pitts.	20.3132	20.3132	19.3132	19.26
No. 2 fdry., Chicago	19.50	19.50	18.75	18.50
Southern No. 2, Birm.	15.50	15.50	14.50	14.50
Southern No. 2 del. Cincinnati	20.2007	20.2007	19.2007	19.13
No. 2X eastern, del. Phila.	21.6882	21.6882	20.6882	20.63
Malleable, Valley	19.50	19.50	18.50	18.50
Malleable, Chicago	19.50	19.50	18.75	18.50
Lake Sup. charcoal, del. Chi.	25.2528	25.2528	24.8728	24.04
Ferromanganese, del. Pitts.	90.13	90.13	90.13	89.79
Gray forge, del. Pitts.	19.6741	19.6741	18.6741	18.63

Scrap

Heavy melting steel, Pittsburgh	$14.50	14.05	13.65	13.50
Heavy melt. steel, No. 2, east. Pa.	11.25	11.25	11.00	9.71
Heavy melting steel, Chicago	13.25	13.35	12.50	12.15
Rails for rolling, Chicago	14.25	14.50	14.00	12.90
Railroad steel specialties, Chicago	14.25	14.25	13.50	13.40

Coke

Connellsville, furnace, ovens	$3.50	3.55	3.55	3.60
Connellsville, foundry, ovens	4.00	4.10	4.35	4.60
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.18c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.45c-2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.43c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.55c-2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.00c-3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.08c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 5 to 25 tons)

Pittsburgh	1.85c
Chicago or Gary	1.90c
Duluth	2.00c
Birmingham	2.00c
Cleveland	1.90c
Buffalo	1.95c
Detroit, delivered	2.00c
Pacific ports, f.o.b. cars, dock	2.40c
Philadelphia, del.	2.16c
Boston, delivered	2.27c
New York, del.	2.20c
Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	2.06c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

Wire Products
(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$61.00

To Manufacturing Trade

Plain wire, 6-9 gage	2.30c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $5.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massilon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo, 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring ..... base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 ..... carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23/8-in.

Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-strip, Pitts., Cleve.	2.60c
Detroit, del.	2.65c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$28.00
45-50 lbs.	$25.00
50-60 lbs.	$26.00
70-75 lbs.	$24.50
80-90 lbs.	$26.00
100 lbs.	$27.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll, qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.60c
Track bolts, base	3.60c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage and Machine

½ x 6 and smaller	70-10-5 off
Do. larger	70-10 off
Tire bolts	55 off

Plow Bolts

All sizes	70-10 off

Stove Bolts

In packages with nuts attached 72½-10 off; in packages with nuts separate 72½-10-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65-5 off
Elevator bolts	65-5 off

Nuts

S. A. E. semifinished hex., ½ to 7/8-inch	60-20-15 off
Do., ½ to 1-inch	60-20-15 off
Do., over 1-inch	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
7/8-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do., under 5 kegs; no disc. on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and 3/8	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
1/8-inch butt weld	50½
¼—3/8, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

1/8—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots or 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B
Stnd. fitgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$29.00
Philadelphia	34.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	29.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	40.00
Chicago	41.00
Worcester, Mass.	42.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.50- 3.65
Connellsville, fdry.	4.00- 4.25
Connel., prem. fdry.	5.50- 5.75
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

*Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50
St. Louis, del.	10.00
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
*Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	18.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	6.75c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	20.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	20.58	20.58	20.08	.....
Cincinnati from Birmingham	20.20	.....	19.20	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.93	21.93	21.43	22.43
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.07	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus $1.21 switching charges			67c, 81c and
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25

Delivered from Basing Points:	No. 2 Fdry	Malleable	Basic	Bessemer
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.62	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lyles, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon. 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$20.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all-rail	$16.00
Do., for barge	$17.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti. base	75.00
Do., del. Pittsb'gh	80.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
*Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
*Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Jan. 2	9.25	9.37½	8.85	48.25	46.87½	4.50	4.35	4.85	*19.00	14.00	35.00
Jan. 3	9.25	9.37½	8.85	47.65	46.55	4.50	4.35	4.85	*19.00	14.00	35.00
Jan. 4	9.25	9.37½	8.85	47.50	46.30	4.50	4.35	4.85	*19.00	13.75	35.00
Jan. 6	9.25	9.37½	8.85	46.90	45.95	4.50	4.35	4.85	*19.00	13.75	35.00
Jan. 7	9.25	9.37½	8.85	47.00	45.87½	4.50	4.35	4.85	*19.00	13.75	35.00
Jan. 8	9.25	9.37½	8.85	47.12½	45.85	4.50	4.35	4.85	*19.00	13.75	35.00
Jan. 9	9.25	9.37½	8.85	47.12½	45.80	4.50	4.35	4.85	*19.00	13.75	35.00
Jan. 10	9.25	9.37½	8.85	47.25	45.87½	4.50	4.35	4.85	*19.00	12.62½	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.62½
Copper hot rolled	16.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	16.62½
Seamless copper	16.75
Rods	
High yellow brass	13.12½
Copper, hot rolled	13.50
Anodes	
Copper untrimmed	14.00
Wire	
Yellow brass (high)	15.12½

OLD METALS

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	5.75- 6.00
*Cleveland	6.37½- 6.50
Chicago	6.00- 6.12½
St. Louis	6.00- 6.25
Heavy Copper and Wire	
New York, No. 1	7.00- 7.25
Chicago, No. 1	7.00- 7.25
Cleveland	6.75- 7.00
St. Louis, No. 1	7.00- 7.37½
Composition Brass Borings	
New York	5.00- 5.25
Light Copper	
New York	5.75- 6.00
Chicago	5.50- 5.75
*Cleveland	5.87½- 6.00
St. Louis	5.75- 6.00
Light Brass	
Chicago	3.37½-3.62½
Cleveland	3.25- 3.50
St. Louis	3.50- 3.75
Lead	
New York	3.50- 3.75
Cleveland	3.50- 3.75
Chicago	3.37½-3.62½
St. Louis	3.65- 3.75
Zinc	
New York	2.00- 2.25
Cleveland	2.50- 2.75
St. Louis	2.75-3.00
Aluminum	
Borings, Cleveland	9.00- 9.50
Mixed, cast, Cleve.	13.25-13.50
Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	15.00-15.25

SECONDARY METALS

Brass ingot, 85-5-5-5	9.50
Stand. No. 12 alum.	17.00-17.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	9.50- 9.75
Boston, domestic	7.75 8.00
Buffalo, No. 1	9.75-10.00
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	13.00-13.50
Cleveland, No. 1	13.25
Cleveland, No. 2	12.25
Detroit, No. 1	10.00-10.50
Detroit, No. 2	8.75- 9.25
Eastern Pa., No. 1	12.00-12.50
Eastern Pa. No. 2	11.00-11.50
Federal, Ill.	10.00-10.50
Granite City, R. R.	10.50-11.00
Granite City, No. 2	9.25- 9.75
N. Y., deal. No. 2	7.75- 8.00
N. Y., deal. barge	8.75- 9.00
Pitts., No. 1 (R. R.)	14.50-15.00
Pitts., No. 1 (dlr.)	14.25-14.75
Pittsburgh, No. 2	13.00-13.50
St. Louis	9.25- 9.75
Toronto	8.00
Valleys, No. 1	13.75-14.00

COMPRESSED SHEETS

Buffalo, dealers	11.00-11.50
Chicago, factory	12.00-12.50
Chicago, dealer	11.50-12.00
Cleveland	12.50-13.00
Detroit	10.50-11.00
E. Pa., new mat.	11.50-12.00
Pittsburgh	14.25-14.75
St. Louis	7.00- 7.50
Valleys	13.25-13.75

BUNDLED SHEETS

Buffalo	9.00- 9.50
Cincinnati, del.	8.00- 8.50
Cleveland	9.75-10.25
Pittsburgh	13.00-13.50
St. Louis	5.50- 6.05

SHEET CLIPPINGS, LOOSE

Chicago	7.50- 8.00
Cincinnati	7.50- 8.00
Detroit	7.50- 8.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	12.50-13.00
Buffalo	15.00-15.50
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	14.00-14.50
Detroit	13.50-14.00
Pitts., open-hearth, 3 ft. and less	15.25-15.75
St. Louis, 2 ft. & less	14.00-14.50

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	13.50-14.00
Pittsburgh	14.50-15.00
St. Louis	11.50-12.00
Buffalo	12.00-12.50

STOVE PLATE

Birmingham	7.00- 7.50
Boston, dealers	4.75- 5.00
Buffalo	10.25-10.75
Chicago	7.00- 7.50
Cincinnati, dealers	7.50- 8.00
Detroit, net	7.00- 7.50
Eastern Pa.	9.50- 9.75
N. Y., deal. fdry.	6.50- 7.00
St. Louis	7.00- 7.50

COUPLERS, SPRINGS

Buffalo	14.50-15.00
Chicago, springs	14.00-14.50
Eastern Pa.	15.50-16.00
Pittsburgh	16.00-16.50
St. Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.25-12.75
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	14.50-15.00
Cleveland, billet, bloom crops	16.00-16.50
Eastern Pa., crops	15.50-16.00
Pittsburgh, billet, bloom crops	17.00-17.50
Pittsburgh, sheet bar crops	15.75-16.25

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	11.50-12.00

SHOVELING STEEL

Chicago	13.00-13.50
Federal, Ill.	9.75-10.25
Granite City, Ill.	8.75- 9.25

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	12.00- 12.50
Chicago, No. 1, net	12.00-12.50
Chicago, No. 2	13.00-13.50
Cincinnati, No. 2	11.00-11.50
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal.	9.50-10.00
St. Louis, No. 1	9.25- 9.75
St. Louis, No. 2	10.50-11.00
Toronto, No. 1	6.00

SPECIFICATION PIPE

Eastern Pa.	11.50
New York, dealers	4.00- 4.50

BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	12.00-12.50
Cinci., No. 1, deal.	8.00- 8.50
Cincinnati, No. 2	5.00- 5.50
Cleveland, No. 2	8.25- 8.75
Detroit, No. 1, new	9.75-10.25
Valleys, new, No. 1	13.00-13.25

MACHINE TURNINGS

Birmingham	4.00- 4.50
Boston, dealers	3.50- 3.75
Buffalo	5.75- 6.25
Chicago	6.50- 7.00
Cincinnati, dealers	6.00- 6.50
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	7.50- 8.00
New York, dealers	4.00- 4.50
Pittsburgh	9.75-10.25
St. Louis	3.25- 3.75
Toronto	3.50
Valleys	9.00- 9.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.75- 8.25
Cincinnati, dealers	5.50- 6.00
Cleveland	8.25- 8.75
Detroit	5.75- 6.25
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.50
Pittsburgh	8.00- 9.00

CAST IRON BORINGS

Birmingham, plain	4.00- 4.50
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.75- 8.25
Chicago	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Cleveland	8.25- 8.75
Detroit	5.75- 6.25
E. Pa., chemical	10.00-12.00
New York, dealers	3.50- 4.00
St. Louis	3.75- 4.25

PIPE AND FLUES

Cincinnati, dealers	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	9.50-10.00
New York, dealers	5.00- 5.25
St. Louis	5.00- 5.50

FORGE FLASHINGS

Boston, dealers	6.75- 7.00
Buffalo	11.00-11.50
Cleveland	11.00-11.50
Detroit	9.00- 9.50
Pittsburgh	13.00-13.50

FORGE SCRAP

Boston, dealers	4.50- 5.00
Chicago, heavy	14.00-14.50
Eastern Pa.	12.25-12.75

ARCH BARS, TRANSOMS

St. Louis	12.25-12.75

AXLE TURNINGS

Boston, dealers	3.75- 4.25
Buffalo	10.50-11.00
Chicago, elec. fur.	13.00-13.50
Eastern Pa.	11.00
St. Louis	8.50- 9.00
Toronto	4.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point	11.00-11.25
Buffalo	14.50-15.00
Chicago, net	14.50-15.00
Eastern Pa.	17.00
St. Louis	12.75-13.25
Toronto	8.00

SHAFTING

Boston, ship. point	13.00-13.25
Eastern Pa.	18.50
New York, dealers	13.50-14.00
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	9.50-10.00
Boston, iron deal.	7.75- 8.00
Buffalo, iron	11.00-11.50
Buffalo, steel	14.50-15.00
Chicago, iron	13.00-13.50
Chicago, rolled steel	14.00-14.50
Cincinnati, iron	11.00-11.50
Eastern Pa., iron	13.50-14.00
Eastern Pa., steel	15.50-16.00
Pittsburgh, iron	14.00-14.50
Pittsburgh, steel	15.75-16.25
St. Louis, iron	10.25-10.75
St. Louis, steel	12.00-12.50
Toronto, net	7.00

NO. 1 CAST SCRAP

Birmingham	9.50-10.00
Boston, No. 1 mach.	9.00- 9.25
Boston, No. 2	8.25- 8.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	11.50-12.00
Buffalo, mach.	12.50-13.00
Chicago, agri. net	10.00-10.50
Chicago, auto	11.00-11.50
Chicago, mach. net	12.00-12.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	10.50-11.00
Cleveland, cupola	12.75-13.25
Detroit, net	11.50-12.00
Eastern Pa., cupola	12.50-13.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	13.75-14.25
San Francisco, del.	13.50-14.00
Seattle	7.50- 9.00
St. Louis, No. 1	10.75-11.25
St. L., No. 1 mach.	12.50-13.00
Toronto, No. 1, mach., net	8.50

HEAVY CAST

Boston, del.	6.50- 6.75
Buffalo, break.	10.25-10.75
Cleveland, break	10.50-11.00
Detroit, No. 1 mach. net	12.00-12.50
Detroit, break.	9.50-10.00
Detroit, auto net	11.50-12.00
Eastern Pa.	12.00
N. Y., break. deal.	7.50- 8.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	11.50-12.50
Boston, consum.	13.50-14.50
Buffalo	15.00-15.50
Chicago, R. R.	15.75-16.25
Cincinnati, agri. del.	12.50-13.00
Cleveland, rail	16.00-16.50
Detroit, auto net	13.00-13.50
Eastern Pa., R. R.	15.00-15.50
Pittsburgh, rail	16.50-17.00
St. Louis, R. R.	13.75-14.25
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	8.00- 8.50
Buffalo	12.00-12.50
Chicago	14.00-14.50
Eastern Pa.	13.00-14.00
New York, dealer	9.75-10.25
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	15.50-16.00
Eastern Pa.	15.00-15.50
Pittsburgh (heavy)	16.00-16.50
Pittsburgh (light)	15.50-16.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.50
No. Afr. low phos.	10.50
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	10.50
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. E., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.25

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.00c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.36c
Chicago (j)	3.00c
Cincinnati	3.22c
Cleveland	3.00c
Detroit	3.09c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.11c-3.26c
New Orleans	3.35c
New York‡ (d)	3.31c
Pitts. (h)	2.95c-3.10c
Philadelphia*	3.03c
Portland	3.70c
San Francisco	3.50c
Seattle	3.70c
St. Louis	3.25c
St. Paul	3.25c-3.40c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.36c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.22c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.25c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.36c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.37c
Philadelphia*	2.98c
Pittsburgh (h)	3.15c
Portland (i)	3.70c
San Francisco	3.50c
Seattle (i)	3.70c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, 5/16-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York (d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh (h)	3.15c
Portland	3.55c
San Francisco	3.50c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh (h)	2.95c
San Francisco	3.60c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.30c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	2.95c
Buffalo	3.25c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.02c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.25c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.90c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.30c
Philadelphia*†	4.40c
Pitts.**(h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.50c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, 5/16-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York (d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh (h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.55c

COLD FIN. STEEL

Baltimore (c)	3.73c
Boston	3.90c
Buffalo (h)	3.55c
Chattanooga*	4.13c
Chicago (h)	3.50c
Cincinnati	3.72c
Cleveland (h)	3.50c
Detroit	3.79c
Los Ang. (f) (d)	6.00c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.81c
Philadelphia	3.76c
Pittsburgh	3.50c
Portland (f) (d)	6.15c
San Fran. (f) (d)	5.95c
Seattle (f) (d)	6.15c
St. Louis	3.75c
St. Paul	4.02c
Tulsa	4.65c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70-10
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) shapes other than rounds, flats, fillet angles, 3.15c.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; † New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Jan. 9

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.44 3 2 6	$14.51	1 15 0
Basic bessemer	15.44 3 2 6*	12.10	1 11 0
Hematite, Phos. .03-.05	16.09 3 5 0	.....	.....
SEMIFINISHED STEEL			
Billets	$27.22 5 10 0	$19.02	2 7 0
Wire rods, No. 5 gage	42.08 8 10 0	36.44	4 10 0
FINISHED STEEL			
Standard rails	$40.84 8 5 0	$44.53	5 10 0
Merchant bars	1.65c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.65c 7 10 0	1.14c	3 1 6
Plates, ††¼ in. or 5 mm.	1.76c 8 1 3	1.56c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.15c 9 15 0	2.13c	5 16 0††
Sheets, gal., 24 gage, corr.	2.59c 11 15 0	2.28c	6 5 0
Bands and strips	1.87c 8 10 0	1.46c	4 0 0
Plain wire, base	2.04c 9 5 0	1.76c	5 5 0
Galvanized wire, base	2.37c 10 15 0	2.15c	5 17 6
Wire nails, base	2.65c 12 0 0	1.75c	4 15 0
Tin plate, box 108 lbs.	$ 4.65 0 18 9	.....	.....

British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	17 32	3 10 0(a)	$17.13	260	$12.85	385	$25.41 (b) 63
Basic bessemer pig iron	17 32	3 10 0(a)	12.52	190	11.83	350	28.03 (b) 69.50
Furnace coke	4 70	0 19 0	6.26	95	3.89	115	7.66 19
Billets	27.22	5 10 0	28.34	430	18.25	540	38.92 96.50
Standard rails	2.21c	8 5 0	2.00c	671	1.65c	1,100	2.41c 132
Merchant bars	2.31c	8 12 0	1.68c	560	90c	600	2.01c 110
Structural shapes	2.34c	8 15 0	1.65c	550	90c	600	1.97c 107.50
Plates, ††¼-in. or 5 mm.	2.43c	9 1 3	2.10c	700	1.05c	700	2.32c 127‡
Sheets, black	3.09c	11 10 0§	1.80c	600‡	1.24c	825‡	2.64c 144
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.62c	13 10 0	3.00c	1,000	2.25c	1,500	6.77c 370
Plain wire	2.49c	9 5 0	2.64c	900	1.73c	1,150	3.17c 173
Bands and strips	2.52c	9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 66.25 per cent over paper sterling.

Bars

Bar Prices, Page 52

Cleveland—Demand for bars has regained most of the pre-holiday strength. Specifications from automobile forge shops are heavy, though not quite up to the December average. General consumers' activities are steady. Agricultural implement production continues at capacity. That industrial work is on the ascendency is indicated by the fact builders of steam shovels and mechanical trench digging machines are ordering more material. On public works projects emphasis has been placed on hand shovels and tools. Oil well equipment makers also are buying material. After a long strike the Mather Spring Co., Toledo, O., manufacturing for the automobile industry, has resumed partial operations. The magnificent home of the proprietor of this company recently was burned to the ground. Bar prices are firm.

Chicago—Bar specifications have recovered most of the losses experienced during the holidays, and with sales at a high rate, the outlook for the early part of this quarter is good. Sales disclose little immediate letdown in automotive operations, and demand from farm implement manufacturers is well maintained. Voiding of the AAA casts some uncertainty over the farm equipment outlook, though the outcome of this situation as it affects implement purchases will depend on what substitute is created to bolster farm prices and income and on future trends in grain and livestock prices.

Pittsburgh—A fair volume of business in merchant bars is being done in this district. However, demand is not up to expectations of late December. The market is holding firmly at 1.85c for 5 to 25-ton lots. Automobile demand for alloy bars continues at 2.45c. While demand has recovered somewhat from the holiday slump, it has not picked up as much as had been expected. Producers attribute this to irregular manufacturing schedules following the holiday season.

New York—With inventory season now practically over, commercial steel bar sellers anticipate some improvement in specifications. Stocks at warehouses and consumers' plants are generally low, notwithstanding a little flurry in specifications around the latter part of November when there was considerable talk of higher prices.

Boston — Specifications for steel bars are slightly improved, following the end of the inventory season.

Parker Appliance Co., Cleveland, has removed its entire plant to 17325 Euclid avenue, to take care of increased demand for its products.

Plates

Plate Prices, Page 52

Chicago—Prospective business in fabricated plates is more favorable. Oil companies are considering extensions and improvements to facilities which will take fairly large tonnages, these including a 200-mile welded gasoline line in Texas. Pan American Petroleum & Transport Co. has ordered tanks involving 6000 tons. A pipe line in San Diego, Calif., involves 3050 tons. A moderate tonnage of plates will be required for various municipal water tanks on which bids were taken last month, but awarding of which awaits approval of bids since this work is being carried on which government funds in most cases. Plate demand from railroad shops and miscellaneous consumers is steady but only moderately active.

Pittsburgh—Prospects are considered promising for a large volume of business from railroads. Pittsburgh Coal Co. is in the market for ten 1000-ton coal barges, which will call for about 1500 tons of plates and shapes. Repairs to about 20 Carnegie-Illinois Steel Corp. coal barges will require about 700 tons. The market is quoted firmly at 1.80c, Pittsburgh.

Cleveland — Plate specifications constitute only a small proportion of daily orders for finifished steel. Tonnage is not developing in boiler, building or car work, although for the latter prospects appear more promising. Repairs to Great Lakes cargo vessels will require moderate tonnage in February or March.

Philadelphia—Miscellaneous plate buying shows little appreciable improvement but substantial ship and railroad tonnage is in sight. In addition to 20,000 tons which Sun Shipbuilding Co., Chester, Pa., is expected to place at any time for four tankers, 5000 tons is pending for a passenger and cargo ship for American South African Lines Inc., New York. The construction contract for this ship is expected to be placed the latter part of January with at least one Philadelphia yard figuring. An eastern oil company plans to inquire soon for a possible two tankers and the trade expects more to develop within a few weeks. Bath Iron Works, Bath, Me., is low on a ferry for the navy, requiring 500 tons of hull plates and 25 tons of floor plates. Pusey & Jones Corp., Wilmington, Del., was second low.

New York—More than 12,000 tons of plates have been placed recently by oil companies for tank and refinery development. Of this 6000 tons was placed by Socony-Vacuum Oil Co., New York, for a project in Italy and 5000 tons by Pan American Petroleum & Transport Co., New York, for work in Texas, both going to one fabricator. Utility companies are also planning considerable expansion.

Boston—Plate sellers expect early award of a naval ferry to Bath Iron Works, Bath, Me., low bidder. This will require about 500 tons of plates. A small tonnage will be required for 50 rack cars now pending for Bangor & Aroostook.

San Francisco — Awards for 1935 totaled 52,105 tons, compared with 62,671 tons for 1934. Last year's aggregate was the smallest since 1928 when only 45,024 tons were booked. Bids have just been opened on one project which will require almost as much tonnage as was placed last year. The metropolitan water district, Los Angeles, is in the market for close to 44,000 tons for either a welded steel or precast concrete pipe line from 9-foot 8-inch, to 12-foot diameter pipe. San Francisco has just taken bids on 650 tons for a 20 and 24-inch welded steel pipe line and will call for bids soon for 9500 tons for a 60-inch welded steel line. Bids open Jan. 28 for several thousand tons for the El Capitan pipe line, San Diego, Calif.

Contracts Placed

44,000 tons, welded steel pipe, metropolitan water district, Los Angeles, specification 137; bids opened.

9500 tons, 60-inch welded steel pipe, San Francisco; bids soon.

6000 tons, storage tanks, Texas City, Tex., for Pan American Petroleum & Transport Co., New York, to Chicago Bridge & Iron Works, Chicago.

6000 tons, by Socony-Vacuum Oil Co., New York, for work in Italy, to unnamed fabricator.

3050 tons, pipe line, San Diego, Calif.

650 tons, 20 and 24-inch welded steel pipe, San Francisco, contract 101; bids opened.

372 tons, 24 and 36-inch welded steel pipe, schedule 762, treasury department, Los Angeles, to unnamed interest.

250 tons, 4 to 16-inch welded steel pipe, requisition 60, 61, 77, 79 and 80, treasury department, Los Angeles, to unnamed interest.

Cold Finished

Cold Finished Prices, Page 53

Pittsburgh—Cold-finished bars are firm at 2.10c, Pittsburgh. Some automotive business continues to come in but it is not as heavy as recently. Prospects are considered promising, however, for the immediate future, with producers anticipating a good volume of automotive business over ensuing weeks.

Sheets

Sheet Prices, Page 52

Chicago — Automotive interests are ordering sheets only 30 days ahead, and some decrease in assemblies and sheet requirements is looked for next month. Demand from that direction and from other leading consumers has recovered moderately from what letdown was experienced during the holidays and favorable mill operations are scheduled for January. Demand from farm implement manufacturers is steady, though some uncertainty over future business has been injected by the AAA decision. Prices are reported steady with little pressure from consumers as a result of recent weakness in Detroit.

Pittsburgh — Sheet demand is less active than recently though a fair volume of new orders is coming in. The business being booked, however, is not sufficient to make up for the reduction in backlogs. Sellers report the market appears somewhat stronger as regards prices and are of the opinion the present comparative dullness is due to the unusually active buying experienced during November and December. Operations in sheet mills are high, probably averaging over 60 per cent.

Cleveland—Although sheet mills here and in an adjacent lake district operated at capacity last week, the need for additional backlogs is becoming apparent. Specifications from automobile manufacturers are lighter than in December. Additional buying for February will have to be done this month, however, and makers expect this shortly. Steel sellers anticipate January will be a 375,000-car month, compared with 400,000 in December, and 422,000 in the record January, 1929. Demand from refrigerator manufacturers is strong. Some of the latter have been pressing for price concessions but sellers say this has been restricted to the Detroit district.

New York—Moderate improvement in sheet demand is beginning to appear, with less talk of an early advance in prices. Most sellers are comfortably booked, especially for cold finished sheets, on which deliveries of five to six weeks are being generally quoted. Hot rolled sheets are being offered by most sellers at three to four weeks.

Philadelphia — Sheet buying is spotty, with some tonnage reported tentatively placed for the Pennsylvania railroad's 10,000 car program. The state of Pennsylvania has taken bids for 250 tons of No. 25 gage sheets for automobile tags, representing about one-third its annual requirements. Local autobody plants are specifying less freely than five or six weeks ago. Talk of an early price advance has subsided.

Boston—With less discussion of price advances, the sheet market is assuming a steadier tone. Business has not fully recovered from holidays and inventories.

Cincinnati — Sheet specifications have failed to rebound to pre-holiday tonnage but open-hearth capacity in the district is being utilized at about 80 per cent. The decreased demand is noticed both from automobile manufacturers and miscellaneous consumers.

St. Louis — Stovemakers and the implement interests still are heavy buyers, and miscellaneous demands show broadening tendencies. Galvanized demand has slowed down somewhat, which is not unusual at this time of year.

Birmingham, Ala. — Sheet mill operations are steady and demand indicates a continuation for some time. Tennessee Coal, Iron & Railroad Co. is installing rotary shears at its Fairfield sheet mills, to cost $240,000.

Buffalo — Buffalo sheet mills continue to operate at 90 per cent. No immediate change is planned.

Pipe

Pipe Prices, Page 53

Pittsburgh—Tubular goods are moving steadily, but no outstanding business has come out or is in the offing. Oil pipe trade is fair, but mechanical tubing is less active than recently. Improved demand for standard pipe is expected when the building season opens. Pipe mills are estimated engaged at 40 to 50 per cent.

Chicago—Largest of pending orders for cast pipe is 7000 tons of various sizes for Cicero, Ill. New inquiries are light. One of the largest projects under consideration is an 8-inch line to be laid by the Humble Pipe Line Co. between East Texas field and Baytown, Tex., 200 miles. A pipe line pending at San Diego involves 3050 tons of fabricated plates.

Seattle—Some tonnages have been placed subject to PWA approval, but final decisions are dragging. Additional projects are proposed and the outlook for cast pipe is materially improved over a year ago. Entiat Water Co., Entiat, Wash., plans system extensions and improvements.

San Francisco—The outlook for cast pipe during the year is more encouraging than it was at this time a year ago. Awards so far this year have been confined to carload lots. Pending business exceeds 9000 tons, and a heavy tonnage of prospective work is expected to be released for figures soon.

Cleveland—Purchasing of cast pipe for PWA projects has slowed down temporarily, after awards aggregating 735 tons in the week. The market for steel pipe is limited to jobbers' orders for miscellaneous needs.

Birmingham, Ala.—Shops are operating at a better rate than for some time, with numerous orders in hand. Several large tonnages are in sight, including the 4000 tons for bringing in water for the immediate Birmingham district, for which the government has granted about $6,000,000.

Cast Pipe Placed

300 tons, water line, Lansing, Mich., to James B. Clow & Sons, Chicago.

Cast Pipe Pending

7000 tons, various sizes, Cicero, Ill.
1205 tons, Antioch, Calif.; bonds voted.
349 tons, 6 and 8-inch, McCammon, Idaho; bids opened.
321 tons, 4 to 8-inch, Dos Palos, Calif.; general contract to P. L. Burr, San Francisco.
225 tons, water line, Russells Point, O.; bids Jan. 15.
212 tons, water line, Vermilion, O.; bids Jan. 15.
147 tons, 4-inch Bloomington, Idaho; bids opened.
100 tons, 6 to 12-inch, Fullerton, Calif.; bids opened.

Steel Pipe Placed

Unstated tonnage, 200 miles, 8-inch, welded gasoline pipe line, to be laid from East Texas to Baytown, Tex., by Humble Pipe Line Co., Houston, Tex.

Steel Pipe Pending

269 tons, specification C 559, gas department, Long Beach, Calif., seamless, to unnamed interest.

Transportation

Track Material Prices, Page 53

Accumulated needs for cars and locomotives are breaking over the barrier and bringing needs for steel for new equipment and for repairs. The Pennsylvania, in order to obtain a prompt start on its program of 10,000 cars, is said tentatively to have placed requirements for 800 of the cars it will build in its own shops. This is being done while waiting approval of the interstate commerce commission on its distribution of the car orders among various builders. On approval a much larger tonnage will be released.

Bessemer & Lake Erie and Union railroad, both subsidiaries of the United States Steel Corp., are inquiring for 3000 hoppers and gondolas and 25 freight and switching

locomotives. Chicago, Burlington & Quincy has placed a diesel-powered locomotive. The Wabash has opened bids on improvements and repairs to 300 hopper coal cars, estimated to cost about $300,000.

New York Central is expected to issue an inquiry this week for 35,000 tons of rails, bids to close about Feb. 1.

Lehigh Valley is considering construction of 250 composite coal cars of 50 tons capacity and rebuilding of 750 coal cars.

Seattle is considering bids for 500 tons of girder rails for the municipal railway. Seattle & Rainier Valley line, Seattle, is asking a new franchise and purposes buying ten new passenger cars, five trackless trolleys and seven buses.

Domestic freight car orders placed during December totaled 10,050 cars, bringing the total for 1935 to 19,308. This compares with 23,829 cars during 1934. Comparisons are shown in the accompanying table:

	1935	1934	1933	1932
Jan.	24	152	3	159
Feb.	806	19,725	0	35
March	0	30	5	105
April	350	800	50	0
May	2	717	8	60
June	5,151	1,835	500	0
July	500	19	306	25
Aug.	200	105	202	5
Sept.	875	7	23	1,298
Oct.	1,250	75	514	0
Nov.	100	254	533	2
Dec.	10,050	110	316	50
Total	19,308	23,829	2,460	1,739

Rail Orders Pending

500 tons, 7-inch, 82-pound, for Seattle municipal street railway; bids in.

New York Central, 35,000 tons; inquiry expected this week, bids to close about Feb. 1.

Car Orders Pending

Bessemer & Lake Erie and Union railroads, 1000 ninety-ton hoppers, 1000 70-ton hoppers, 1000 70-ton gondolas; bids asked.

Locomotives Placed

Chicago, Burlington & Quincy, one 90-ton diesel-powered locomotive, with two 500-horsepower engines, to Cummins Engine Co., Columbus, Ind.

Locomotives Pending

Bessemer & Lake Erie and Union railroads, 25 road and switching locomotives; bids asked.

Tin Plate

Tin Plate Prices, Page 52

Pittsburgh — Operations of tin mills are estimated at 70 per cent. Specifications are coming in at an encouraging rate and despite a heavy carryover of stocks in mill hands, it is expected operations will continue at this comparatively high level for some time. General-line can requirements are outstanding. Prices are firm.

Strip Steel

Strip Prices, Page 53

Cleveland—Pressure for deliveries has relaxed, although backlogs sustain strip mill operations here at capacity. Renewed buying for automobile manufacture is expected this month, inquiries for substantial tonnages being out. Partsmakers have placed fairly good tonnages for February. Miscellaneous demand is fair.

Chicago — Strip demand has recovered rapidly from the holiday lull. Business shows improvement in many directions, with automotive orders well maintained. Strip prices here generally are steady.

Pittsburgh — Strip demand is less active than recently. Makers expect an improvement shortly. The market is firm with prices unchanged.

New York—Cold strip sellers find a continued brisk demand from automotive accessory manufacturers. This demand appears likely to be important this quarter, although refrigerator manufacturers and builders of certain other household equipment will soon swing into better production for the spring and summer. Prices are unchanged.

Boston—Cold-rolled strip demand is largely for miscellaneous needs and volume is restricted.

Wire

Wire Prices, Page 53

Chicago — Wire activity has surpassed expectations in recovering promptly from the year-end lull. Business currently equals or exceeds that prevailing during the active period before the holidays, where ordinarily the recovery is deferred until the middle or latter part of January. Improvement is well diversified, both as to consumers and products. Jobbers are expected to add further to stocks. The better outlook for domestic building enhances business prospects for wire nails, though the situation in merchant products so far as farm buying is concerned at the moment is clouded by the AAA demise.

Pittsburgh — Wire demand is fair but jobbers are reported fairly heavily stocked. As a result, an active demand over the immediate future is not considered likely. However, specifications and releases against orders continue to come in steadily and the market is firmly intrenched at established levels. Nails are quoted at $2.40 a keg, plain bright wire, 2.30c, and spring wire, 2.90c.

Cleveland—Little change from December averages is noted in the volume of specifications for manufacturers' wire. Buying of farm material is slow. Good demand is expected to develop in the spring months, despite the Supreme Court's decision against the AAA.

Philadelphia—Wire nails are firmer at $2.40, Pittsburgh, with a $2 differential to jobbers. Buying is slow as many consumers covered last month at lower prices. Specifications for manufacturers wire are also rather quiet.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 53

Bolt, nut and rivet demand has expanded moderately since the holiday period. A few jobbers increased stocks before application of higher prices now in effect on bolts and nuts, and this has a certain restricting influence on demand from that source. Business from railroads is spotty, though some interests are fairly active in equipment rebuilding. Consumption by all railroads is substantially heavier than a year ago, and prospects for further gain are favorable. Steady demand continues from the farm implement industry. First quarter contracting largely is completed. Bolt and nut prices are steady, but not thoroughly tested. Large rivets are firm at 2.90c, Pittsburgh and Cleveland, and 3.00c, Chicago, for structural sizes and 70 and 5 off for small rivets.

Semifinished

Semifinished Prices, Page 53

The higher prices announced in November on semifinished steel now are in effect and are being applied on all new business. Demand is only for small lots, however, since most buyers still are taking deliveries against orders placed prior to the close of last year. High tin mill operations are reflected in a steady movement of sheet bars.

Quicksilver

New York—Quicksilver prices are steady in a quiet market at $76 to $78 a virgin flask, depending on quantity. Small lots of 15 to 25 flasks are held at $77.

Illinois Gear & Machine Co., Chicago, has purchased all of the machinery and equipment of the William Ganschow Co. division of Gears & Forging Inc., in Chicago.

Shapes

Structural Shape Prices, Page 52

Chicago—Inland Steel Co. has awarded 4500 tons of structural shapes to an unnamed fabricator, for its open-hearth building, Indiana Harbor, Ind. Bids have been rejected on 17 Illinois bridges involving about 3000 tons of shapes, and new tenders will be taken Jan. 17. This includes the Havana, Ill., bridge taking about 1700 tons in addition to a number of small structures. High prices are given as the reason for the rejection of original bids. The government has changed its intention of awarding 3600 tons of piling for the Miami, Fla., dock to the producers with the highest freight rate to that point, and the original distribution, announced last fall to Bethlehem Steel Co., Bethlehem, Pa., Carnegie-Illinois Steel Corp., Pittsburgh, Inland Steel Co., Chicago, and Jones & Laughlin Steel Corp., Pittsburgh, has been confirmed.

New York — Governor Lehman signed the bill creating the New York city tunnel authority, to build a vehicular tunnel under East river, connecting Manhattan and Queens, with $50,000,000 PWA loan and grant. Ole Sangstad, of the Port of New York authority, will be engineer in charge, but has not estimated steel requirements.

Cleveland—Competition is keen for the relatively small tonnage of shapes pending, some fabricators waiving overhead costs in bidding. Numerous small industrial jobs are being figured. Grade eliminations projects will be handled by the state and may not be awarded until March. Delay also is being encountered in award of 800 tons for Cleveland schools due to necessity of obtaining approvals of general contracts by PWA.

Pittsburgh—The structural market maintains a steady course. Demand is not particularly active. Inquiry is featured by 4400 tons for the Highland Park bridge. A large number of public works projects are in the offing, furnishing some support to the market.

Philadelphia—PWA tonnage on which bids were taken in December, is developing very slowly. Vare Construction Co., general contractor, is expected to award 500 tons soon for New Jersey state bridge in Salem county.

Boston—Several small structural tonnages have been closed in New England, the majority of which are public projects. A moderate number of jobs are pending with several carried over from last month.

San Francisco—First week of the year began strongly with 2336 tons placed. Included among the larger awards were four crossing projects in Los Angeles, involving 2021 tons.

Seattle — Sub-contracts are being released slowly, with contracts pending still of large proportions. Peak of PWA projects was passed last month. Fabricating plants are well supplied with jobs. The week's awards aggregated 800 tons, including 400 tons to Pacific Car & Foundry Co., for the Bonneville, Oreg., powerhouse superstructure.

Shape Contracts Placed

4500 tons, open-hearth building, Inland Steel Co., Indiana Harbor, Ind., to unstated fabricator.

3600 tons, piling, dock improvements, Miami, Fla.; 2022 tons to Jones & Laughlin Steel Corp., Pittsburgh, 674 tons each to Carnegie-Illinois Steel Corp., Pittsburgh, and Inland Steel Co., Chicago, 230 tons to Bethlehem Steel Co., Bethlehem, Pa. Originally reported Sept. 30, 1935.

2000 tons, penstock, Carp, Calif., to Consolidated Steel Corp., Los Angeles.

1100 tons, court house and jail, Oklahoma City, Okla., to Capital Iron Works Co., Topeka, Kans.

760 tons, die shop, Briggs Mfg. Co., Detroit, to Whitehead & Kales Co., Detroit.

700 tons, strip mill at Granite City, Ill., for Granite City Steel Co., to Stupp Bros. Bridge & Iron Co., St. Louis.

650 tons, state bridge, Wilmington, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

650 tons, overcrossing, Wilmington, Calif., to Pacific Coast Steel Corp., San Francisco.

610 tons, coal handling plant, McNally-Pittsburgh Mfg. Corp., Harrisburg, Ill., to Kansas City Structural Steel Co., Kansas City, Mo.

525 tons, Meyer apartment, San Francisco, to Pacific Coast Steel Corp., San Francisco.

550 tons, two state highway bridges, New York, at Warners and Norwich, to Bethlehem Steel Co., Bethlehem, Pa.

483 tons, crossing, El Cerrito, Calif., to Moore Drydock Co., Oakland, Calif.

400 tons, storage building at Milwaukee for the Schlitz Brewing Co., to Milwaukee Bridge Co., Milwaukee.

400 tons, superstructure powerhouse, Bonneville, Oreg., project, to Pacific Car & Foundry Co., Seattle.

375 tons, state bridge at Manasquan, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

362 tons, undercrossing, Hobart street, Los Angeles, to unnamed interest.

360 tons, western high school, to R. C. Mahon Co., Detroit, Mich.

334 tons, undercrossing, Soledad, Calif., to Moore Drydock Co., Oakland, Calif.

310 tons, junior high school, Troy, N. Y., to Steel Fabricating Co., Muskegon, Mich.

300 tons, coast guard air station, San Diego, Calif., to Pacific Coast Steel Corp., San Francisco.

300 tons, state bridge Skamania county, Washington, to Pacific Car & Foundry Co., Seattle; Puget Sound Bridge & Dredging Co., Seattle, general contractor.

300 tons, school at Fitchburg, Mass., to Boston Bridge Works, Cambridge, Mass.

300 tons, bridges, Orleans, Nebr., to St. Joseph Structural Steel Co., St. Joseph, Mo.

290 tons, bridge at Manhattan, Kans., for the C. R. I. & P. railroad, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, Phillip Brooks school, Roxbury, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

235 tons, undercrossing, Santa Clara, Calif., to Moore Drydock Co., Oakland, Calif.

230 tons, bridges, Deuel county, Nebraska, to Omaha Steel Works, Omaha, Nebr.

230 tons, undercrossing, Firestone boulevard, Los Angeles, to unnamed interest.

225 tons, buildings for Climax Molybdenum Co., Langeloth, Pa., to Levinson Steel Co., Pittsburgh.

210 tons, bridge for the state of Colorado at Kit Carson, to American Bridge Co., Pittsburgh.

200 tons, infirmary building, San Haven, N. Dak., to Minneapolis-Moline Power & Implement Co., Minneapolis.

200 tons, addition to Timken Roller Bearing Co., Canton, O., to Burger Iron Co., Canton.

195 tons, National Mortar & Supply Co., building, Pittsburgh-Des Moines Steel Co., Pittsburgh.

190 tons, undercrossing, San Leandro, Calif., to Moore Drydock Co., Oakland, Calif.

185 tons, high school addition, South Boston, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

175 tons, power plant, Neponsit beach hospital, Long Island, N. Y., to Drier Iron Works Inc., New York.

160 tons, die shop addition, Murray Corp. of America, Detroit, to R. C. Mahon Co., Detroit.

150 tons, 15 lookout towers for United States department of agriculture in Michigan and Minnesota, to Aermotor Co., Chicago.

150 tons, crossing, Buena Vista, Orange county, California, to unnamed interest.

140 tons, high school, Swampscott, Mass., to West End Iron Works, Cambridge, Mass.

130 tons, state bridge, Kittitas county, Washington; to Virginia Bridge & ron Co., Roanoke, Va.

125 tons, two state bridges, Ben Lomond, Santa Cruz county, California, to Bethlehem Steel Co., San Francisco.

125 tons, bulb angle curbs, New York, to Egleston Bros. & Co. Inc., from United States treasury department, procurement division, New York.

107 tons, crossing, San Jose, Calif., to Judson-Pacific Co., San Francisco.

100 tons, alterations to pier No. 73, East river, New York, to Egleston Bros. & Co. Inc., from United States treasury department, procurement division, New York.

100 tons, undercrossing, San Bernardino county, California, to unnamed interest.

100 tons, including St. Clair and State street school additions, Painesville, O.,

Shape Awards Compared

	Tons
Week ended Jan. 13	**24,216**
Week ended Jan. 4	**20,075**
Week ended Dec. 28	**17,295**
This week, 1935	**9,246**
Weekly average, 1935	**17,081**
Weekly average, 1936	**22,145**
Weekly average, December	**23,300**
Total to date, 1935	**33,269**
Total to date, 1936	**44,291**

and Hough and Waverly school additions, Cleveland, to Republic Structural Iron Works, Cleveland.

Shape Contracts Pending

4260 tons, state highway projects, Illinois; bids Jan. 17.

3000 tons, shop buildings and hangars for the United States government, at Pensacola, Fla.

3000 tons, 17 state bridges, Illinois; bids rejected, new bids Jan. 17.

2500 tons, office building for the E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.

2300 tons, government air station, Pensacola, Fla.

2000 tons, two buildings, Rockefeller center, New York; bids asked.

1550 tons, west side elevated highway addition, New York; specifications out.

1350 tons for Rockefeller apartments, East Fifty-fourth and East Fifty-fifth streets, New York, general contract to Post & McCord, New York.

900 tons, power station, Richmond, Va., for Virginia Electric & Power Co.

675 tons, two bridges for New York Central railroad, at Rotterdam and Newark, N. Y.

640 tons, four state highway bridges, Iowa.

500 tons, armory, Rock Island, Ill.; new bids taken.

500 tons, power house addition at Detroit, Chevrolet Motor Co.

450 tons, Republican river bridge, St. Francois, Kans.

390 tons, bridge, for the New York transit commission in the Bronx.

350 tons, auditorium and arts building, Michigan City, Ind.

270 tons, regional high school, Springfield, N. J.; Breen Iron Works, Newark, N. J., low.

230 tons, public school 127, New York; bids open.

123 tons, for elevated railroad alteration, Myrtle avenue, Brooklyn, N. Y., general contract to Post & McCord, New York.

113 tons, Owyhee river state bridge, Malheur county, Oregon; bids opened.

Reinforcing

Reinforcing Bar Prices, Page 53

Pittsburgh—Considerable government work is pending, but the market is comparatively inactive, with private construction work limited. Some road work jobs are in prospect and a fairly heavy tonnage will be required within the next few weeks for various school projects in the Pittsburgh district. The market continues to hold at 2.05c, base, Pittsburgh, in carload lots of billet bars.

Chicago—Bar awards are moderately active, with approximately 1300 tons involved in orders for eight nearby projects. These include 325 tons for a Chicago bridge, 190 tons for a Waukegan, Ill., school, and 160 tons for the outer drive project. The volume of pending business points to a fairly active rate of shipments during the current quarter.

New York—Although actual awards are small, pending requirements are large, including 1000 tons for New Jersey state highway work, 900 tons for a sewer in New York city, and 736 tons for the procurement division of the treasury department. Prices on carload lots range from 2.25 to 2.40c base, f.o.b. New York, going down as low as 2.10c on especially attractive lots.

Cleveland—The market is quiet. State work appears to be the most promising, although the railroad grade elimination program is not likely to be started until spring.

San Francisco—Awards for the first week of the year aggregated 3169 tons, including 1050 tons for two crossing projects in Los Angeles. Pending business exceeds 64,000 tons, most of which may be closed this month.

Philadelphia—Business is light with general contracts awarded, on the majority of Pennsylvania and New Jersey state road work projects of December, but subletting of steel is developing slowly. Some sellers look for substantial portion to pend for several weeks until construction season opens. Outstanding award involves 175 tons for Pennsylvania state highway, Cumberland county, to Bethlehem Steel Co., Bethlehem, Pa., through H. W. Schaull & Sons, Harrisburg, Pa.

Seattle—Demand is confined almost entirely to PWA projects. Tonnages pending are substantial, but are awaiting federal approval. The majority of jobs are small. Awards in the week approximated 750 tons.

Reinforcing Steel Awards

1100 tons, sewer, Wards island, New York, to Bethlehem Steel Co., Bethlehem, Pa., through Underpinning & Foundation Co., New York.

715 tons, crossing, Figueroa street, Los Angeles, to unnamed interest.

650 tons, Twenty-ninth street bridge, Baltimore, to National Building & Supply Co., Baltimore.

625 tons, crossing, El Cerrito, Calif., to Truscon Steel Co., Youngstown, O.

600 tons, Twenty-ninth street bridge, Baltimore, to National Builders Supply Co., Baltimore.

500 tons, assembly plant, General Motors Corp., South Gate, Calif., to unnamed interest.

335 tons, undercrossing, Mission road, Los Angeles, to unnamed interest.

325 tons, state bridge, 147th street, Chicago, to Calumet Steel Co., Chicago.

300 tons, Washington state and county highway projects, to Northwest Steel Rolling Mills, Seattle.

270 tons, women's dormitory, University of Washington, Seattle, to Bethlehem Steel Co., San Francisco.

260 tons, Punch Bowl reservoir, Honolulu, to unnamed interest.

250 tons, Olive street sewer, Louisville, Ky., to American Builders' Supply Co., Louisville.

238 tons, overcrossing, Wilmington, Calif., to unnamed interest.

200 tons, school for junior college, Fullerton, Calif., to unnamed interest.

190 tons, Kula sanitorium, Maui, T. H., to unnamed interest.

190 tons, school, Waukegan, Ill., to Calumet Steel Co., Chicago.

175 tons, water storage tank, Aurora, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

160 tons, Randolph street viaduct, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, sewer, Des Plaines, Ill., to Inland Steel Co., Chicago.

150 tons, Illinois state highway bridge, to Joseph T. Ryerson & Son Inc., Chicago.

150 tons, Quilcene state bridge and Bellingham normal school, to Pioneer Sand & Gravel Co., Seattle.

150 tons, state undercrossing, San Leandro, Calif., to Soule Steel Co., San Francisco.

138 tons, proposal No. 238, United States engineer's office, Los Angeles, to Los Angeles Iron & Steel Co., Los Angeles.

120 tons, Herbert Hoover auditorium, Glendale, Calif., to unnamed interest.

105 tons, five water projects, Honolulu, to unnamed interest.

106 tons, addition to high school, Los Gatos, Calif., to San Jose Iron & Steel Co., San Jose, Calif.

100 tons, overcrossing, Riverside county, California, to unnamed interest.

100 tons, undercrossing, Firestone boulevard, Los Angeles, to unnamed interest.

100 tons, crossing, Hobart street, Los Angeles, to unnamed interest.

100 tons, gymnasium, manual arts high school, Los Angeles, to unnamed interest.

100 tons, school for deaf and blind, Tucson, Ariz., to unnamed interest.

100 tons, dormitory, Teachers college, Flagstaff, Ariz., to unnamed interest.

100 tons, coast guard air station, San Diego, Calif., to unnamed interest.

100 tons, Henderson street sewer, Seattle, to Northwest Steel Rolling Mills, Seattle.

100 tons, miscellaneous school buildings, Washington, to Northwest Steel Rolling Mills, Seattle.

100 tons, state overcrossing, Soto street, Los Angeles, to unnamed interest

100 tons, Chicago stock yards postoffice, to Calumet Steel Co., Chicago.

100 tons, state hospital, Kankakee, Ill., to Concrete Engineering Co., Chicago.

Concrete Awards Compared

	Tons
Week ended Jan. 13	**9,352**
Week ended Jan. 4	**2,440**
Week ended Dec. 28	**3,965**
This week, 1935	**6,560**
Weekly average, 1935	**6,862**
Weekly average, 1936	**5,896**
Weekly average, December	**8,282**
Total to date, 1935	**7,498**
Total to date, 1936	**11,792**

Reinforcing Steel Pending

960 tons, Slemany boulevard sewer, San Francisco; general contract to Healy-Tibbetts Co., San Francisco.

900 tons, sewer contract No. 12, New York, Rogers & Haggerty, New York.

736 tons, public jobs, United States treasury department, procurement division, New York. W. Ames & Co., Jersey City, N. J., low.

700 tons, route 25, section 24, Burlington county, New Jersey; state highway department; John Lafferty, Haddon Heights, N. J., low.

700 tons, route 6, section 7, New

Jersey state highway department; George M. Brewster, Bogata, N. J. low.

600 tons, Calumet intercepting sewer, Chicago; Underground Construction Co., Chicago, general contractor.

300 tons, route 34 section 5, Monmouth county, New Jersey, state highway department; S. J. Groves & Sons, Ridgefield, N. J., low.

285 tons, Grove street pier, Oakland, Calif.; general contract to A. W. Kitche, San Francisco.

250 tons, state under-crossing, Stockton, Calif.; general contract to Biasotti, Willard & Biasotti, Stockton.

200 tons, filtration plant, Ft. Knox, Ky.; bids Jan. 13.

192 tons, administration building, Bush & Stockton streets, San Francisco; general contract to Lindgren & Swinerton, San Francisco.

118 tons, foundation, Motor Vehicle building, Sacramento, Calif.; general contract to Raymond Concrete Pile Co., San Francisco.

116 tons, crossing, Palo Alto, Calif.; general contract to Eaton & Smith, San Francisco.

110 tons, school, Ramsay, N. J. General contract to Hugh Montague, Jersey City, N. J.

Pig Iron

Pig Iron Prices, Page 54

Pittsburgh—New buying is developing slowly, and orders are for small lots. The higher prices announced in November are being quoted on all new business. Pittsburgh furnace base continues $19 on basic grades, $19.50 on foundry, and $20 on bessemer.

Chicago—Sellers expect consumer's stocks, accumulated late last quarter, to be reduced sufficiently by mid-February to permit resumption of normal buying. Foundry schedules have increased since the holidays, now averaging close to the rate of a month ago. Occasional reports are heard of reduced production of automotive castings, and a more general letdown is anticipated during the next several weeks.

Cleveland—Shipments have fallen off, as anticipated, after the December rush. It appears that the January movement will be about 60 per cent of that in December, and on a parity with November. Consumption in automobile and radiator manufacture is a little slower. The general outlook for the early months this year, however, is promising. Moderate sales are being made at the advanced price.

Boston—Sales so far this month have been light, as has been generally expected, in view of substantial shipments in the closing weeks of last year. General improvement, however, is anticipated as the quarter advances.

New York—Foundry melt is showing some improvement since the first of the year, although most consumers are well stocked for the time being. Scattered fill-in orders are noted, but the aggregate is relatively small. Prices are steady.

Philadelphia — Sellers report a pickup in foundry melt, but expect relatively light buying throughout the month, as most consumers are fairly well stocked.

Buffalo—Demand is steady. Producers are short in some grades. While new buying is light, the aggregate is better than had been hoped for, following the heavy shipments in November and December.

Cincinnati—The market is inactive following heavy shipments during November and December. Specifications against incompleted contracts at the old price are beginning to appear, but new business is firm at the $1 advance. With some foundries again in production after holiday shutdowns, the melt stands about 50 per cent, or comparable to the fourth quarter level. Melt of machine tool foundries tends upward.

St. Louis—With chief users holding large stocks, acquired during November and December, the market is quieter. All new transactions are for prompt delivery and bear the new price. The melt is surprisingly large for this time of year.

Birmingham, Ala.—Production is active, and deliveries are steady. Melters, especially cast pipe and stove manufacturers, report good conditions.

Toronto, Ont.—The position of consumers regarding orders is having a stimulating effect on merchant sales, and local blast furnace representatives expect general improvement in demand in the immediate future.

Scrap

Scrap Prices, Page 55

Chicago—Scrap still is marking time while mills remain out of the market. A moderate tonnage of heavy melting steel remains to be shipped against old contracts, but increase of consumption points to early re-entry of steelworks into the market. Prices remain firm, with No. 1 heavy melting steel continuing $13 to $13.50. Sellers are unable to pick up this grade at much less than $13.25, with railroad offerings bringing at least $13.75.

Cleveland—Added firmness characterizes the scrap market as supplies of most grades continue scarce. Railroad lists recently offered are small and dealers are loath to sell at prevailing prices. Shipments currently are confined locally to some heavy steel, blast furnace material and a few pressed sheets. At this time, consumers appear fairly comfortably fixed with scrap but are expected to buy around the end of this month. Valley prices also are firmer on scarcity of supplies, having been marked up by 25 to 50 cents.

Pittsburgh—A strong tone prevails in the scrap market here though demand is not particularly heavy. High steel mill operations, however, encourage dealers to look for a much improved volume of business soon. Flow of scrap to the district is somewhat restricted. Prices are unchanged.

Boston—Good quantities of scrap continue to leave New England for export, principally for Great Britain. This situation and an advancing market at Pittsburgh is conducive to strong prices here although no change has been made in quotations.

Philadelphia—Upward trend in prices of steel and iron scrap is reflected in slight advances in several grades. Although steadiness is shown in the principal steel items, heavy breakable cast has been reduced to a flat $12. While not marked, an improvement is shown in sales volume. A furnace at Swedeland, Pa., has closed on 3000 tons at $6.25, delivered, in line with current quotations. A nearby consumer has closed on a moderate tonnage of No. 2 steel within the current spread. A substantial tonnage of No. 1 steel has been bought for Bethlehem and Steelton, Pa., at $12, delivered, including other than local material. A consumer at Pencoyd, Pa., has bought 3500 tons of new compressed sheets from Edward G. Budd Mfg. Co., Philadelphia, at a price over $11 at the Budd plant.

A recent opening at the Philadelphia navy yard brought bids of $11.07, yard, on 400 gross tons of No. 1 steel, $7.75 on 100 tons of light iron, $6.52 on 75 tons of borings and turnings and $9.25 on 100 tons of oversize No. 1 steel.

About 8000 tons of No. 1 and No. 2 steel are being loaded here for Italy, the first in several weeks. A similar tonnage of steel is being loaded at Baltimore for Scotland as part of a considerable tonnage now moving to the United Kingdom.

New York—Bad weather has cut down the movement of iron and steel scrap to some extent, but consumption holds up well. As a result, prices on certain grades have moved up somewhat. This is particularly the case with cast iron borings which have moved up 25 cents. No. 1 heavy melting steel for barge loading has moved up 25 cents to $8.75 to $9, and No. 2 steel or auto scrap for barge loading is up 25 cents to $7.75 to $8. Prices for No. 1 specification pipe and machine shop turnings have moved up 50 cents to $4

to $4.50. Scrap continues to be loaded for shipment to Italy and Japan against contracts.

Buffalo—Dealers are active bidders for scrap to apply on contracts but new buying is limited to small lots. A few odd cars of No. 1 heavy melting steel have been sold at $12.50 but dealers holding tonnage will not part with material at this price. Malleable, cast, turnings and borings and low phosphorus have sold in small lots at prices which, according to dealers, are at the top of current quotations. Negotiations for purchase of large tonnage of heavy melting steel are expected to start before the end of the month.

Cincinnati—The iron and steel scrap market, with possible exception of No. 1 machinery cast, is stronger after a series of post-inventory sales aggregating about 15,000 tons, little of this representing blast furnace material. Dealer quotations in most grades pushed higher, with heavy melting steel now quotable at $11 to $11.50.

Detroit—The iron and steel scrap market is notably strong, principally due to outside demand. Meanwhile, offerings of scrap by automobile and parts manufacturers for January delivery are 10 to 15 per cent less than in December. Heavy melting steel is now $8.75 to $9.25, compressed bundles $10.50 to $11, No. 1 new bushings $9.75 to $10.25, borings, mixed boring and turnings, and machine shop turnings $5.75 to $6.25.

St. Louis—From a standpoint of new buying, the market for iron and steel scrap is virtually at a standstill, and no betterment is looked for before February. Shipments on contracts however, are in substantial volume, and melters are taking in all quotas due on contracts.

As has been the case for a number of months, mills are strenuously resisting dealer prices, and while a number of operators are in need of material, they are loath to lift their bids.

Birmingham, Ala.—While some old material is moving and melters are buying more freely, dealers anticipate better business. Larger consumers of heavy melting steel are buying spasmodically. Dealers have good stock but a large volume of scrap iron and steel is not available. Prices are practically unchanged.

Seattle—Prices are reported unchanged but in view of the lack of export business the market has not been tested for some time. There is no inquiry from Japan or China. There is still some local turnover, but the mills are buying more No. 2 heavy melting steel than No. 1.

Toronto, Ont.—Following the holiday season there is new activity in iron and steel scrap. Substantial shipments of steel scrap are being made to the Hamilton district and some large contracts have been placed. Heavy melting steel is the most active grade. Foundries are taking larger shipments of machinery cast, and there is a fair call for malleable. Prices are firm.

Metallurgical Coke

Coke Prices, Page 53

Shipments of both furnace and foundry coke are slow in the Pittsburgh district. Prices are holding at established levels, however, and in some quarters it is believed improved demand will develop over the next few weeks.

Shipments of by-product foundry coke in January at Chicago are only a shade smaller than a month ago and rebound to the better rate is expected at once. Prices are not changed from those prevailing during fourth quarter. Cincinnati suppliers found a slackening during the holidays but a normal shipping rate has been restored. Demand in the Birmingham, Ala., district has caused a larger production than for some time.

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Superior Hot & Cold Rolled Strip Steel

CLOSE metallurgical control . . . uniform rolling to accurate gauge and frequency of inspection bring out the *supers* in SUPERIOR strip steels.
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Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.
H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

Warehouse

Warehouse Prices, Page 56

New York—Widespread selling of galvanized second sheets has broken the market on galvanized prime. Seconds of high quality have sold at as low as 3.50c to 3.25 base delivered. Warehouses are meeting this situation by quoting prices on application. On lots of less than 500 pounds the price is 4.30c delivered for 24 gage. On lots of 500 to 1500 pounds the base becomes 4.16c and on more than 1500 pounds the base price sometimes is 3.81c delivered. The market is irregular and cannot be quoted definitely.

Outside of galvanized sheets the market is steady on domestic material. There is some irregularity in price in connection with foreign bands and angles which are bringing as low as 1.90c base delivered. Foreign bars in some cases are being ordered in lengths of a little more than 30 feet. The end bearing the stencil of a foreign maker, it is said, is cropped off and discarded, making it difficult to detect that the steel is of foreign origin.

Cleveland—Some fairly good orders were placed during the week, mainly for the lighter products. Prices are steady.

Chicago—Increase in business has been more rapid than usual for the first of the year. Price changes are limited to products on which mill quotations recently were changed. These include advances on track bolts, spikes and cold-drawn bars, and a reduction on wire nails.

Boston—Cold-finished bars have been advanced $3 a ton in the local warehouse market, to 3.90c. Other quotations are unchanged. Buying is showing some improvement as January gets under way.

Baltimore—An advance of 15 cents per 100 pounds in cold finished steel is expected to become effective shortly. Jobbers say trade conditions are beginning to shape up well since Jan. 1. They are looking for at least the same volume this month that was experienced in November and the first part of December.

Philadelphia—Following the recent $3 advance in cold finished bars, prices are unchanged. Sheet seconds are not the disturbing factor that they are in adjacent districts. Jobbers expect improvement as month advances.

Cincinnati—Sales continue restricted to a volume not much better than during the holiday period. There are no inquiries so that the outlook for the next week or so is clouded, but jobbers are confident that dullness is merely seasonal. Prices are unchanged.

St. Louis—Business has shown a marked pickup with demands well diversified, and purchasing by the railroads of shop, bridge and track materials representing sizable aggregate. Coal, lead, and zinc mines have increased their orders and the glass and cement interests also are accounting for fair tonnages.

Detroit—Iron and steel warehouse business in December was higher than November and considerably better than in December, 1934. January has opened at almost the December level, though the market lacks something of the late 1935 snap. Prices are steady.

Seattle—The market has been quiet, although buying is expected to be resumed shortly. PWA jobs offer good prospects. The price structure is unchanged.

Iron Ore

Iron Ore Prices, Page 55

Cleveland—Iron ore shipments from Lake Erie docks to interior fur-

Behind the Scenes with STEEL

Vital Statistics

ANOTHER *Yearbook of Industry* has made its bow and by this time has been acclaimed by many, so we won't bore you with telling how good we thought it was. But our Bureau of Vital Statistics has brought to light a number of interesting figures concerning this initial number of STEEL for 1936 which possibly may stagger you.

There were 252 advertisers represented, with space ranging all the way from 1/16 page to 6 full pages. Thirty used two or more pages. Color appeared in 115 ads, on 19 editorial pages. The latter totaled 151 1/6 pages. In the editorial section were 22 charts, 35 illustrations and a helluva lot of tables. Most of the illustrations were full page affairs, about evenly divided between art layouts and photographs.

In the market history section were set before your eyes the awesome total of 10,453 separate price quotations.

If the 10,000 copies of the issue were stacked up, one on another, they would tower 531 feet into the air, unless they blew over before the 10,000th was in position, which is quite likely these days. This is just about as high as the Bankers Trust building at No. 6 Wall St., New York, in case you are interested.

Each copy weighed 2 pounds 10 ounces, so the entire run consumed 26,250 pounds of paper, not counting a lot of trimmings and scrap. Just a mere 13 tons of 60-pound white and India coated. Envelopes alone for mailing the issue weighed 1250 pounds, or ⅝ of a ton. No figures are available on weight of ink consumed.

Last Monday we set a fellow to reading the entire issue, word for word, ads and editorial, in order to find out how long it would take a reader to digest the issue. Saturday night we called the fellow up to see how he was coming along. He mumbled into the 'phone that he hadn't had any sleep all week and had only reached The Business Trend Section. Maybe he'll get through this week; we'll let you know.

* * *

Turtles, etc.

ADVERTISERS hit a new high mark in the presentation of their messages. Typography and art work combined to ring the bell loudly and to set a new plane of perfection for future issues.

We especially liked that spread (pp. 24, 25) of Basic Dolomite Inc., engineered by C. A. Reece, crafty Cleveland adman. That was the one which showed the turtle glomming onto an unsuspecting fish somewhere in the great expanse of the briny deep, all suffused with an effulgent green that made the reader feel like Dr. Beebe on the ocean floor.

We asked Mr. Reece about how it was done and he told us that first separate photographs were taken of the turtle, the fish (a dead one incidentally), and the water. Then these photos were cut out, mounted in proper position and plates made.

Some difficulty was experienced with the turtle, whose name we didn't catch. He was a big snapper, about 10 inches in diameter, and to get the picture his head had to be pulled out with pliers and wired in position. He didn't like it very well and showed his displeasure by biting a pencil in half.

Mr. Reece wanted to get some bubbles in the water above the fish, but the museum of natural history put a stop to that idea, pointing out that fish breathe water only and produce no bubbles when in action. Turtles, however, are amphibian critters, so bubbles would be O.K. for them.

Turtles actually are very fond of fish, especially the type shown in this picture. Mr. Reece didn't know what variety of finny denizen it was. Thought it might be a lake trout, but didn't want to be quoted.

* * *

Coup d'Etat

ONE thing maybe you didn't notice about the Yearbook was its decided tendency toward being tractable. You could open to any page and the magazine would lie flat, open all the way to the binding. That's something which we think you will not find in any other bulky magazine of this sort.

One of the more active minds in our printing department worked out the idea months ago. He fixed up a dummy copy by this new binding method and sent it all over the United States, from one city to another. Someone would receive it, open it up, note the blank pages and send it on to someone else in disgust. Finally it came back to Cleveland—in perfect condition. Hadn't pulled apart a bit.

It was only a short step to adapt this method to binding the Jan. 6 issue, and it gives the reader — and advertiser — a good break. Guarantees that the entire page will be seen.

Now if the Penton Press would care to send this department some little token of appreciation, such as a suit of clothes, they know where we're at.

—SHRDLU

naces in December, amounting to 238,022 tons, compare with 93,387 tons in the month in 1934. Dock balances were reduced to 5,093,441 tons, according to the following report from the Lake Superior Iron Ore association, showing receipts and shipments for the season:

Port	Receipts	Shipments	Dock Balance Jan. 1, 1936
Buffalo	2,127,812	4,013	3,184
Erie	1,035,642	1,072,104	67,987
Conneaut	3,437,860	3,413,402	1,734,304
Ashtabula	2,936,836	2,479,533	1,748,470
Fairport	772,260	778,813	387,085
Cleveland	5,455,295	4,042,034	745,201
Lorain	2,097,114	1,097,679	12,527
Huron	748,178	703,021	365,502
Toledo	1,296,231	659,870	29,181
Total	19,907,228	14,250,469	5,093,441
Comparative 1 Year Ago	15,572,523	11,192,155	5,155,331

Receipts for the season at other ports:

Port	Season
Detroit	1,154,338
Indiana Harbor	1,517,513
Gary	1,885,632
South Chicago	3,030,884
Sault Ste. Marie, Ont.	224,455
Hamilton, Ont.	358,674
Total	8,171,496
Comparative 1 Year Ago	6,454,664

Steel in Europe

Foreign Steel Prices, Page 56

London—(*By Radio*)—Business in steel and iron in Great Britain is now resuming on a large scale that will necessitate employment of additional blast and open-hearth furnaces. The threat of a coal strike makes the outlook somewhat uncertain. Pig iron is growing scarce and the semi-finished output is insufficient, causing delay in deliveries of finished products. Makers of sheet bars are out of the market. Tin plate and galvanized sheets are dull. Steel exports generally are quiet.

The Continent reports export markets are quiet, but the outlook is fairly satisfactory.

Nonferrous Metals

Nonferrous Metal Prices, Page 54

New York—Consumer buying of major nonferrous metals was slow last week although moderate tonnages of lead were booked. Tin and antimony prices declined but others held steady. Trade interests watched developments in Washington and Europe closely.

Copper—Releases against old orders were heavy indicating an improved apparent rate of consumption. Fresh demand was quiet but all producers continued to quote electrolytic unchanged at 9.25c, Connecticut. Prices on certain copper and brass rolled products advanced ¼ to ½-cent per pound due to higher fabricating costs.

Zinc—Feature of the zinc market was the active rate of shipments against old orders with those of prime western estimated at 5200 tons for the week ended Jan. 4. New demand was dull but prices held at 4.85c, East St. Louis, for prime western.

Tin—Quotations moved somewhat lower on declines in London and absence of buying support in this country on most days. The close was fairly steady, however, at about 47.12½c for Straits spot.

Lead—Moderate bookings were recorded with substantial buying still pending. The market was quotably unchanged at 4.35c, East St. Louis.

Antimony—Prices declined to 12.62½c on American spot and 10.37½c, c.i.f. in bond New York, on Chinese futures due to weakness in the market in China. Demand was slow. The Hunan antimony syndicate has been dissolved and an antimony control bureau has been appointed by the Nanking government.

HIGH STRENGTH "A.W." "70-90" STEEL

READILY WELDED "A.W." "70-90" STEEL

EASILY FABRICATED "A.W." "70-9[illegible]" STEEL

ALAN WOOD STEEL CO. ESTABLISHED 1826 TRADE "A.W." MARK CONSHOHOCKEN, PA.

A super strength steel that reduces dead weight and increases pay load

- **Yield point** (lb. per sq. in.) **70,000 min.**
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- **Elongation** (% in 2 in.) **20 min.**

A "safe" steel that meets the demand for a higher strength, lighter weight material for modern engineering design. *Write for details.*

109 Years' Iron and Steel Making Experience

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Ferroalloys

Ferroalloy Prices, Page 54

New York—Most consumers of ferromanganese now are under contract at the reduced price of $75, duty paid, seaboard, and are specifying more freely than they did in the closing weeks of last year. Domestic spiegeleisen shipments have been steadier in recent weeks than ferromanganese deliveries, as prices, as announced in the early part of December, were reaffirmed for the first quarter. Prices for domestic spiegeleisen, 19 to 21 per cent, are $26, Palmerton, Pa., on quantities up to 50 tons, and $24 on 50 tons and over.

Financial

LUDLUM Steel Co., Watervliet, N. Y., resumed dividends on its common stock last week when it ordered 25 cents paid Feb. 15 to record of Feb. 5. Following one of the best fourth quarters in the company's history, Ludlum reports an increase in sales for 1935 of 27 per cent. It is indicated that net earnings, after all charges including provision for federal income tax, will show an increase of 40 per cent over 1934; this estimate does not include pro rata earnings of subsidiary companies.

REPUBLIC FUNDS BONDS

Republic Steel Corp., Cleveland, plans to simplify its capital structure by issuance of $45,000,000 of series B bonds, due Feb. 1, 1961, to refund 13 issues of securities of Republic and its subsidiaries. Bonds to be retired include those of the old Trumbull Steel Co., Republic Iron & Steel Co., Union Drawn Steel Co., Interstate Iron & Steel Co., Donner Steel Co., Steel & Tubes Inc., Dilworth, Porter & Co., Witherow Steel Corp., and Trumbull-Cliffs Furnace Co.

EARNINGS ARE DOUBLED

Grand Rapids Metalcraft Co., Grand Rapids, Mich., reports a net profit of $72,489 for the fiscal year ended Nov. 30, 1935, compared with $33,315 in the preceding year.

PARKER TO SPLIT SHARES

Stockholders of the Parker Rustproof Co., Detroit, will vote Jan. 30 on a proposal to increase the authorized capital stock to 500,000 shares of $2.50 par to replace the present 250,000 no par shares and convert each outstanding common share into three new shares. A dividend of $1.12½ on the present common stock will be paid Feb. 20 to record of Feb. 10. The previous return was 75 cents quarterly.

DIVIDENDS DECLARED:

Briggs Mfg. Co., Detroit, 50 cents quarterly on the common, Jan. 29 to record of Jan. 17.

Continental Can Co., New York, 75 cents quarterly on the common, Feb. 15 to record of Jan. 25.

Eaton Mfg. Co., Cleveland, regular of 25 cents and extra of 12½ cents, Feb. 15.

J. D. Adams Mfg. Co., Indianapolis, regular of 15 cents Feb. 1 to record of Jan. 15.

Mullins Mfg. Corp., Salem, O., $1.75 on preferred, March 1 to record of Feb. 10. First dividend since Aug. 1, 1931.

Maytag Co., Newton, Iowa, $2.25 on arrearage on cumulative preferred, $1.75 on first preferred, regular of 75 cents on cumulative preferred, Feb. 1 to record of Jan. 15.

Bridgeport Machine Co., Bridgeport, Conn., $1.50 against arrearage on preferred, Jan. 30 to record of Jan. 20.

Labor

A NEW high level for steelworks employment was set in November, according to the American Iron and Steel institute. The 438,370 employes at work in November were more than double the low point of 1932. Payrolls were slightly lower owing to a fractional decrease in hours worked. A comparison follows:

	Nov., 1935	Oct., 1935
Total number of employes	438,370	436,554
Total payrolls	$49,170,940	$51,456,368
Hours per week per wage earner	35.7	36.8
Average hourly earnings, wage earners	65.8c	65.4c
Ingot production (gross tons)	3,153,247	3,146,446

New Capacity

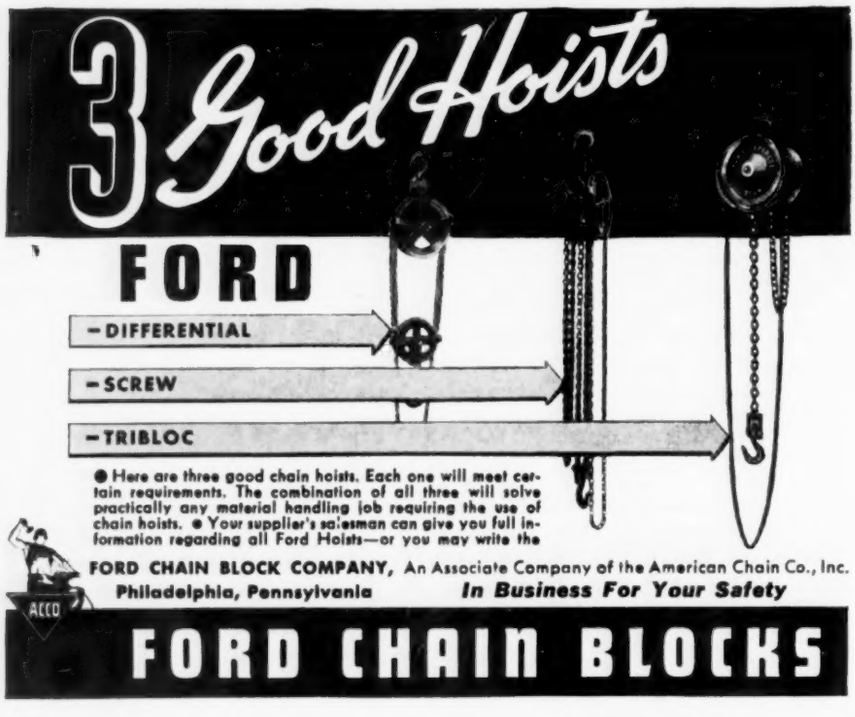
INLAND Steel Co., Chicago, will replace four old open-hearth steel furnaces at its Indiana Harbor, Ind., works with four new 150-ton furnaces. A contract was placed last week with several Milwaukee fabricators for a new open-hearth building requiring 4500 tons of shapes. Corollary equipment will be installed, including a blooming mill for which the Mesta Machine Co., Pittsburgh, has the contract.

At present, Inland has fifteen 125-ton and twelve 75-ton open-hearth furnaces, with an annual capacity of 2,000,000 tons of ingots. The new units thus will increase Inland's capacity several hundred thousand tons.

Transportation

FIRST transcontinental motor freight run in history, consisting of a caravan of Ford trucks carrying 72,000 pounds of pay load, recently completed the run in 6 days, 23 hours, 47 minutes from Los Angeles to New York. Keeshin Transcontinental Freight Line Inc., Chicago, now operating 1400 trucks, plans to establish regular seven-day heavy-duty freight service between New York and Pacific coast points.

The reduction department of the Niagara Falls plant of the Aluminum Co. of America will be placed in


3 Good Hoists
FORD
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● Here are three good chain hoists. Each one will meet certain requirements. The combination of all three will solve practically any material handling job requiring the use of chain hoists. ● Your supplier's salesman can give you full information regarding all Ford Hoists—or you may write the
FORD CHAIN BLOCK COMPANY, An Associate Company of the American Chain Co., Inc.
Philadelphia, Pennsylvania
In Business For Your Safety
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production for the first time in five years about Feb. 15. The pots are being relined in preparation for such operations.

Activities of Steel Users and Makers

LADD EQUIPMENT CO., First National Bank building, Pittsburgh, for several years sales agent in the Pittsburgh tri-state area for Poole flexible couplings, manufactured by the Poole Foundry & Machine Co., Woodberry, Baltimore, has added all of Ohio, except the immediate Cincinnati district, to its sales territory. A district office will be maintained in the Rockefeller building, Cleveland, in charge of G. H. Bales, who has had a number of years of experience in selling this class of equipment.

• • •

Philadelphia offices of the American Rolling Mill Co., Middletown, O., will be moved from the Lewis Tower building to 1808 Lincoln Liberty building, Chestnut street, Feb. 1. A. M. Wordley is in charge.

• • •

Plaskon Co. Inc., is the new name of Toledo Synthetic Products Inc., effective Jan. 1. The product of this company is Plaskon, a urea formaldehyde plastic. There will be no change in the personnel or management of the company. New York offices will be opened in January at 41 East Forty-second street.

Republic Has Merger Deal On; Closes Taylor Plant

Republic Steel Corp., Cleveland, has been conducting negotiations in New York for the acquisition of a steel company, the name of which has not been disclosed. Most speculation has centered on the Gulf States Steel Co., Birmingham, Ala., in which Republic already has a substantial stock interest. Last week the name of a New York state steel company was rumored in this connection, also an Ohio manufacturer. No official statement is to be issued until negotiations have been completed.

Republic has closed the N. & G. Taylor Co., Cumberland, Md., a tin plate mill which it acquired when it took over the Corrigan, McKinney Steel Co. Orders will be concentrated at Warren, O., because of more modern facilities and advantageous freight rates.

Equipment

New York—While the holidays and inventory taking time served to restrict the brisk volume of buying that has featured the machine tool market in this territory in recent months, an early resumption of good buying is indicated. A number of large metalworking companies have appropriated money for the purchase of new machine tools. In addition, a good many other companies are inquiring for new tools. Most current transactions are limited to lots of one or a few machines. Trend in prices on machine tools is toward higher levels, based on the higher cost of producing the machines. While there has been no general increase, prices on certain models have been modified upward. Among the bright spots is an active demand for sheet metal working equipment. There are indications of advance in prices on such equipment in the near future.

Chicago—Activity in some equipment markets has shown marked

SPECIAL SEAMLESS SHELLS AND SHAPES

DEEP DRAWN TANKS, BOTTLES, ETC.

IS OUR SPECIALTY

This Square Seamless Drawn Tank is

A Crosby Accomplishment

MADE FROM 3/16" STEEL

12½" DEEP 6⅞" SQUARE

Stamping Specialists Since 1896

An Experience You Should Not Overlook

Send Us Your Next Specification

THE CROSBY COMPANY

BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

gains since Jan. 1. Machine tool sales are heavier, including a moderate number of orders covering inquiries which were issued only a short time ago.

Some export business also has been booked. Automotive plants have placed fairly substantial orders for machinery and equipment lately, while signs are appearing of renewed interest by railroad shops in equipment rehabilitation. Demand from the latter for repair parts has continued active. Deliveries on certain types of machine tools still are deferred by builders' backlogs, this situation having been corrected but little the past 30 days.

Seattle — Waterworks equipment continues in good demand but awards are being delayed due to various causes. Lumber production is improving and the industry is making some expenditures for replacements. Electrical equipment is required in many public projects.

Construction and Enterprise

Illinois

BELLEVILLE, ILL.—Belleville Auto Parts Co., 305 South Twentieth street, has been incorporated to do a general automobile business, by Leon and E. Rubenstein and S. Gallop. Correspondent is Edward K. Schwartz, 304 Wainwright building, St. Louis.

CHICAGO—Randall-Horner Construction Co., 1608 Sherwin avenue, has been organized by Max Glazer, Lucille Miller, and Grace R. Kimball, to do a general engineering and contracting business. Correspondent is Charles Danto, 135 South La Salle street.

CHICAGO—Hy-Lo-Matic Oil Burning Co., 2066 Elston avenue, has been incorporated for the manufacture, sale, and installation of all types of heating, mechanical, and electrical devices, by Edward Scholz, Edward J. Stadler, and William F. Faulkenberg.

CHICAGO—Aviation Products Co., 619 South Federal street, has been incorporated to deal in planes and other products or articles used in aviation, by H. H. Woeltjen, Beulah Caley, and Arthur T. Pullen. Correspondent is Bailey S. Stanton, 188 West Randolph street.

CHICAGO—Rose Smelting & Refining Co., 29 East Madison street, has been incorporated to deal in metals, by Abel Levy, L. Posner, and Henry L. Rose. Correspondent is Abel, Levy & Schwetterer, 77 West Washington street.

CHICAGO—Liquid Carbonic Corp., 3112 South Kedzie avenue, is erecting two new buildings in this city, which will increase the floor space for manufacturing more than 120,000 square feet. The project includes a steel frame factory building, 120 x 500 feet. General contractor is Kaiser-Ducett Co., Kansas City, Mo.

CHICAGO — International Harvester Co., Harrison and Michigan avenue, this city, has purchased property, 200 x 300 feet, at Logan boulevard and Elston avenue, on which will be built a 1-story truck service station and show room building, containing 32,300 square feet of floor space.

CHICAGO — Burning Brands Co., 1400 West Fulton street, has been incorporated by Robert Reid, Eleanor W. Smith and T. D. Smith, to deal in branding iron implements, etc. Correspondent is Brewer Smith & Farrell, 1559 Continental Illinois Bank building.

CHICAGO—Iron & Steel Products Inc., Railway Exchange, wants a diesel engine-generator set, 1000-kilowatt, 3 phase, 60 cycle.

CHICAGO — Drake Electric Works Inc., 3654 Lincoln avenue, has been incorporated by Walter A. Kuehl, Mildred Woolf and George Feigel, to generally deal in electrical heating devices. Correspondent is Louis W. Reinecker Jr., 100 West Monroe street.

CHICAGO—Bendix Aviation Corp., 105 West Adams street, has announced the formation of a new manufacturing and distributing organization in the marine field, together with the inauguration of an extensive program in the development of modern scientific navigation equipment, in marine engineering research, and marine power plant design. The new subsidiary will be known as the Bendix Marine Products Co., and details will be announced in the near future. Vincent Bendix is chairman of the board.

Michigan

BATTLE CREEK, MICH. — George E. Weston Co. Ltd. of Toronto, Ont., announces that it will go ahead on plans for the construction of a plant for manufacturing biscuits here, on a 15-acre site.

DEARBORN, MICH. — Tenders have been invited by the Ford Motor Co. for construction of a continuous glass melting furnace, to be installed in the safety glass factory at the Rouge plant. The furnace will cost about $500,000 and will increase the capacity of the plant from 75,000 to 200,000 square feet of rough plate glass per day.

DEARBORN, MICH.—Universal Products Co., 6455 Kingsley avenue, is expanding production facilities by about 30 per cent, principally through installation of modern machinery.

DETROIT—Atomic Welders Inc., 115 Brady street, has been organized to manufacture parts, etc., by Harold Sheldon, 120 West Montcalm street.

DETROIT—Taylor & Gaskin Inc., 3105 Beaufait avenue, has been incorporated to deal in structural steel, by Mervyn G. Gaskin, 14840 Terry avenue.

DETROIT—Wayne Screw Products Co., 5247 Western avenue, is erecting a 60 x 140-foot factory on St. Jean avenue. Harry Angell, Detroit, is architect.

FLINT, MICH.—Work has been started here on a $70,000 improvement and development program at the Bishop airport, a PWA project.

GRAND RAPIDS, MICH. — Fisher Body Corp., subsidiary of General Motors Corp., Detroit, plans the installation of power substation facilities, motors and controls, regulators, conveyors, electric hoists and other equipment, in new multi-unit plant for steel stamping and die manufacturing. Cost to be over $5,000,000.

WATERVLIET, MICH. — Watervliet Paper Co. is building a plant addition. Preparations are under way for building a large addition to the shipping department, which will be started early in the spring and necessitate changing the course of the Paw Paw river.

TRAVERSE CITY, MICH.—Colonel Floyd Evans, state aeronautical director, has announced that the application for $40,000 federal aid for the completion of a city-county airport here, and the construction of a hangar, has been approved.

JACKSON, MICH.—Plans have been completed for the construction of a

These Springs Look Alike

This spring has a long, and useful life of one hundred million or more compressions.

This spring may fail before reaching one hundred thousand compressions.

THE DIFFERENCE?

Here

Carefully selected materials; Proper design and manufacturing methods; controlled heat-treating; and the Fifty Years Experience of

RAYMOND MFG. CO.
Corry, Pa.
Producers of Superior Springs

Here

Ordinary spring wire, Out-of-date methods, poorly regulated heat treatment, lack of broad experience, produce the ordinary spring, perhaps useful fifty years ago, but worse than useless in the high grade engineered products of today.

small foundry building for the William Cobb Foundry Co.

JACKSON, MICH.—Expenditure of $125,000 for enlarging the binder twine plant at the Southern Michigan prison, this city, has been authorized by the state prison commission.

Indiana

FORT WAYNE, IND.—N. & L. Iron & Steel Co. Inc., 4218 Tacoma street, has been incorporated to deal in waste materials, by Nathan Liff, Fanny Liff, and William Lavine. Resident agent is Nathan Liff, above address.

GARY, IND.—Calumet Region Iron & Steel Co. Inc., Tenth and Virginia streets, has been incorporated to deal in iron, steel, brass, copper, and all other kinds of metal junk, by Ben I. Schultz, Ruth Schultz, and Gazella Schultz. Resident agent is Ben Schultz, 761 Connecticut avenue, this city.

HUNTINGTON, IND.—Albra Castings Corp., 1128 Salomonie avenue, has been incorporated to manufacture and deal in metals, by Herman Voges Jr., Vincent W. Pacula, and Senour B. Richey.

INDIANAPOLIS — Fairbanks, Morse & Co., 900 South Wabash street, Chicago, will resume operations as soon as possible at its plant on Twenty-first street and Northwestern avenue here, under plans calling for the expenditure of between $50,000 and $100,000, in a repair program. The plant will be occupied by the Fairbanks Morse Home Appliances Inc., a subsidiary concern manufacturing home radio receiving sets, electric refrigerators, and electric washing and ironing machines. It is hoped plans will be completed by May or June. S. T. Kidoo is vice-president and treasurer of the corporation.

INDIANAPOLIS — Basca Mfg. Co., 1454 East Nineteenth street, has purchased the Houdaille-Hershey Corp. plant at 3019 Roosevelt avenue, involving seven buildings and a power plant. L. L. Swartz is president of the company, which manufactures automobile mufflers and metal stampings. An expansion program is under way.

LAWRENCEBURG, IND. — Schenley Distillers Corp., 20 West Fortieth street, New York, is planning a new addition to its distillery here. Equipment to be installed will double the capacity. Cost is $800,000 and Carl J. Kiefer, Schmidt building, Cincinnati, is vice president in charge of operations.

PORTLAND, IND.—Machine shop of the Portland Forge & Foundry Co. was severely damaged by fire recently.

Ohio

CANTON, O. — Announcement has been made of the re-establishment of a paint factory in the 2-story plant on Harrison avenue southwest, formerly occupied by Arlington Paint & Varnish Co. and J. E. Harris Co., both of Wooster, O. The 35,000 square feet of floor space in the plant have been sold to Harrison Paint & Varnish Co., of Cleveland. G. S. Walters, president, is in charge of improving the plant for immediate occupancy.

CLEVELAND—Dunbar Co., 8201 Cedar avenue, general contractors, has started construction of a three-story addition to the factory of the Passono-Hutcheon Co., paint maker, at 9808 Meech avenue. The addition will be partly of steel and cost about $24,000.

CINCINNATI—Construction of a factory building on Reading road and Tennessee avenue, for the manufacture of thermometers, is contemplated by the Palmer Co., St. Bernard, O. Architects are Grunkenmeyer & Sullivan, 3717 Eastern avenue, and plans will be ready in the spring.

DAYTON, O. — Howard Paper Co. is contemplating the construction of a $1,000,000 envelope plant in this city.

DAYTON, O. — Air corps, contracting officer, materiel division, Wright field, ask bids Jan 27 for a flat surface grinder; Jan. 21 for temperature regulators; Jan. 20 for spring studs, hubs, lever assemblies, adapters, shields and spacers.

MANSFIELD, O. — Empire Sheet & Tin Plate Co. will enlarge its plant in this city, to make tin plate for food containers, at a cost of $300,000.

MIDDLETOWN, O.—Severe damage was done to a 3-story office building and laboratory of the American Rolling Mill Co. here, recently.

SANDUSKY, O. — Legislation to issue $1,100,000 in bonds for a municipal light plant was adopted recently by the city commission in the event that a loan and grant, approved last week by the PWA in Washington, is not obtained.

SANDUSKY, O.—A $1,515,000 PWA allotment to this city for a municipal electric plant distribution system was announced recently by PWA Director Ickes, in Washington.

SANDUSKY, O.—George C. Hill and Norbert J. Kuebeler, former president and treasurer, and general manager of the Made-Rite Mfg. Co., this city, manufacturer of electrical appliances, have announced their purchase of control of the Weinig Mfg. Co., 1814 East Fortieth street, Cleveland, and plan to bring the plant to this city.

Connecticut

BRIDGEPORT, CONN.—Casco Products Corp., 1333 Railroad avenue, is making plans through Fletcher-Thompson Inc., 1336 Fairfield avenue, for a 1-story, 84 x 188-foot brick and steel plant addition, at a cost of $80,000.

BRIDGEPORT, CONN. — Hemco moulding division, Bryant Electric Co., H. E. Seim, general manager, State street, is making plans through Fletcher-Thompson Inc., 1336 Fairfield avenue, for a 1-story, 90 x 200-foot plant, for manufacturing plastic moldings for electrical devices, at a cost of $80,000.

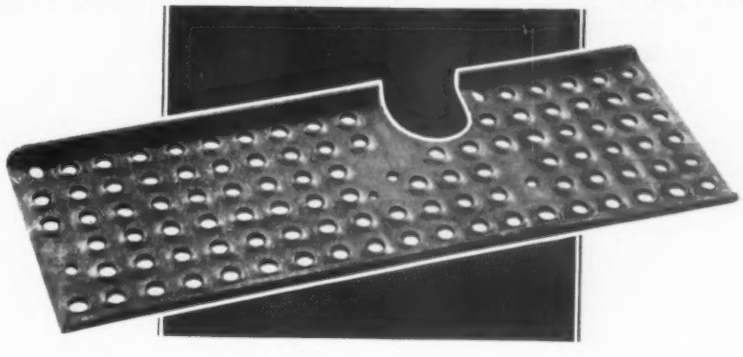
New York

OLEAN, N. Y.—City plans constructing municipal airport, hangars, and administration building, local lighting system and runways, etc., at a cost of $150,000. G. Miles is city engineer, and maturity will be early this year.

NEW YORK — Atlantic Brass & Copper Co., 579 Broadway, has been organized to deal in all metals which serve manufacturing industries, according to H. M. Schwartz, manager. The firm will handle surplus lots of usable brass, nickel silver, copper, zinc, monel metal and aluminum.

NEW YORK — Pepsi-Cola Co. will build a 1-story storage plant on west

RAILROAD SAFETY via STAMPINGS



RAILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

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side of Thirty-fourth street north of Forty-eighth avenue, Long Island City, N. Y., at a cost of $12,000. Kulb & Miller is architect.

NEW YORK—Pennsylvania railroad, T. J. Skillman engineer, Broad street station, Philadelphia, is making plans through H. G. Atwater, for the construction of a 1-story, 13 x 133-foot freight loading platform and freight house, to cost $28,000 with equipment.

PERRY, N. Y.—City has authorized C. L. Reynolds to make a survey to determine whether the community should proceed with plans to construct a $200,000 municipal electric light plant.

New Jersey

JERSEY CITY, N. J. — Oldetyme Distillers Inc. has acquired the Hiram Walker plant on Grove street recently, having a rated capacity of 6000 cases per day. With the addition of new machinery it is expected this will be doubled.

NEWARK, N. J. — Conte Casket Co., New York, of which Rocco Conte is president, has purchased from the McLaurin Jones Co., Brookfield, Mass., a 5-story building on McClellan street, Newark, which the Conte company will alter for the manufacture of caskets. A total area of 40,000 square feet will be utilized.

TRENTON, N. J. — Trenton Compressed Steel Co., this city, has been incorporated by Sidney Byer.

Pennsylvania

CARLISLE BARRACKS, PA. — Bids will be received until Jan. 22 by quartermaster corps, war department, Washington, for construction of a 200,000-gallon elevated steel tank.

PHILADELPHIA — Frankford arsenal asks bids Jan. 17 for tool and cutter grinder; Jan. 16 for universal index center; Jan. 15 for worm gears; Jan. 16 for tensioning machines.

PITTSBURGH — Jones & Laughlin Steel Corp. plans installation of motor generator sets, heavy duty motors and controls, regulators, panel boards, electric cranes and hoists, and other equipment in new steel sheet and strip mills. Project will be carried out in 1936 with cost to be close to $25,000,000.

POTTSTOWN, PA.—Doehler Die Casting Co., Smead and Prospect avenue, Toledo, O., will construct a new plant here or expand its present one early this year, according to Herman H. Doehler, president. Plans call for an increase in the floor space from 75,000 to 225,000 square feet, and the general improvement program will cost $300,000.

LANCASTER, PA. — Lancaster Iron Works suffered $100,000 loss by fire here recently, at its main plant.

JOHNSTOWN, PA.—Johnstown Coal & Coke Co. has been granted a state charter to mine, sell, and ship coal, by Charles E. Evans, A. W. Evans and Dorothy Hoyt.

Alabama

MONTGOMERY, ALA. — City Lines Inc., A. A. Crow vice president, has acquired a site on North Court street for a bus terminal, 100 x 150 feet, to be partly constructed of steel. Bids will be called for soon. Machinery for the greasing and washing of buses will be installed.

Maryland

BALTIMORE—Continental Can Co. Inc., 100 East Forty-second street, New York, is working on a new addition to its plant in this city, to be completed about April 1. The building is to be of concrete and steel, 120 x 400 feet, with railroad sidings and loading platform. O. C. Huffman is president.

MAGNOLIA, MD. — Bureau of aeronautics, department of commerce, Washington, will establish an intermediate landing field in this city, as a PWA project. Cost will be $500,000 and field will extend into Hartford and Baltimore counties. Project includes construction of hangars, runways, installation of modern lighting and landing apparatus, and other equipment.

Kentucky

LOUISVILLE, KY. — Consolidated Electric Co. has been incorporated by George C. Cannon and J. W. Russell, Starke building, this city.

OWENSBORO, KY.—The plant of the Owensboro Sewer Pipe Co. sustained $100,000 damage by fire recently.

Florida

CALLAHAN, FLA. — Everglades Hampers Inc., M. M. Starling president, Belle Glade, Fla., will establish a veneer plant on 10-acre site on highway between Yule, Fla., and this city. Will install modern machinery and drying equipment and erect four buildings. Dr. F. J. Brainerd, Elizabeth City, N. C., will be in charge of plant operation.

MIAMI, FLA.—George B. Willis, 341 Seybold building, general contractor for $69,844 waterworks at Belle Glade, Fla., wants three pumps, gasoline and electric driven, filtration equipment, and 38,000 feet of cast iron pipe.

FORT PIERCE, FLA.—City Manager E. G. Gustafson receives bids Jan. 14 for furnishing material, labor, and constructing extensions and improvements to electric generating plant, including turbo-generators, condensers, circulating and hot well pumps, boiler, steel stack switchboards, and other appurtenant equipment. Gilbert A. Youngberg, Lynch building, Jacksonville, Fla., is consulting engineer.

PENSACOLA, FLA.—Bids are asked for Jan. 15 (extended date) by bureau of yards and docks, navy department, Washington, for constructing hangars, storehouses, shops, test stands, etc., under specification 8082, and for quarters at naval air station, under specification 8083.

SAFE HARBOR, FLA. — City, H. Kindred city manager, will receive bids Jan. 15 for furnishing materials and constructing an extension to water system, including extension to water distribution system, pipe lines, gate valves, well, pumps, and building.

WAUCHULA, FLA. — City, L. M. Moseley, receives bids Jan. 15 for furnishing materials and labor and constructing elevated tank. Project includes cast iron pipe, fittings, and hydrants.

Georgia

SAVANNAH, GA.—Savannah Wire Weaving Co., organized by Julian Howell and Arthur G. Corkery, Atlanta, Ga., will operate a copper and galvanized iron insect screening plant at Port Wentworth, near this city.

Louisiana

NEW ORLEANS—Davies Sales & Engineering Co., Box 1566, wants a locomotive crane, 4-foot, 8½-inch gage, diesel or gasoline driven.

North Carolina

BLACK MOUNTAIN, N. C.—Brittain Freight Lines Inc. has been incorporated by John V. and E. L. Brittain.

BURLINGTON, N. C. — Duke Power Co. proposes to double the capacity of its gas generating plant on Main street, this city, at a cost of $30,000. C. E. Scott is manager.

GREENSBORO, N. C.—Proximity Mfg. Co. has permit for $50,000 warehouse on Cypress street, including a $5500 chemical building.

MOORESVILLE, N. C. — Mooresville Mfg. Co. has been incorporated by B. A. and R. W. Troutman.

Tennessee

CHATTANOOGA, TENN. — United States Stove Works, South Pittsburg, Tenn., is considering moving its general offices to this city and establishing an assembly plant. Project later may include a manufacturing plant. Arthur C. Jones is president.

MEMPHIS, TENN.—Standard Brake Shoe & Foundry Co. has permit for foundry, Bodley and South Main streets, to be constructed of steel and include a coke-fired furnace.

Virginia

HAMPTON, VA.—Plant building and office of Lee & Costen Fertilizer Mfg. Co. plant in Northampton, Va., sustained a loss of $60,000 by fire recently.

Missouri

INDEPENDENCE, MO.—Jackson Co., water supply district No. 1, is making plans for 30 miles of 4-8-inch cast iron distributing mains, including a tank on tower near Grandview, Mo., to cost $206,000. A PWA project, C. A. Haskins & Co., 517 Finance building, Kansas City, Mo., is engineer. J. Walsh, 1201 Bryant building, Kansas City, is attorney.

KANSAS CITY, MO. — Simmons Co., 230 Park avenue, New York, manufacturer of beds, steel bedsteads, etc., is building a new plant in this city with completion scheduled for Feb. 1.

MOREHOUSE, MO.—Harry Himmelberger of Cape Girardeau, Mo., will rebuild mill of Himmelberger-Harrison Mfg. Co.

ST. LOUIS — Cupples-Hesse Envelope & Lithographing Co., 4173 North Kings highway, has plans in progress for additions and alterations to factory building, on south side of Penrose street. Koerner Engineering Co., 1601 Syndicate Trust building, is engineer.

Arkansas

BANKS, ARK. — State utilities commision, Little Rock, Ark., granted permit to Southwest Telephone & Power Co., West Memphis, Tenn., to build a rural line from Harrel, Calhoun county, Ark., to this city, and to build a distribution plant here.

Oklahoma

VINITA, OKLA. — Plant of Baxter Mill & Elevator Co. was damaged by fire recently, with a loss of $20,000.

Texas

AUSTIN, TEX. — Atlantic Refining Co. announces plans for its new refinery

(*Please turn to Page* 72)

LOW VOLTAGE GENERATORS
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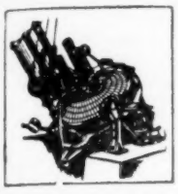

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This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.
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225,000,000 Revolutions Of IXLITE Tool Hard Gear Service

PROBABLY no photograph ever demonstrated in a better manner the true meaning of "built in quality" than the lower IXLITE TOOL HARD GEAR shown in this illustration.

This IXLITE GEAR travelled a total of 402,117 miles as a driving gear on a Type "B" Positive Gear Drive on a Chicago, Burlington & Quincy Railway Club Car. It is estimated that it made 225,000,000 revolutions during its use. This IXLITE TOOL HARD GEAR ran as an open gear—without lubrication—for 10,500 continuous hours and at a pitch line velocity of 2,000 feet per minute. Yet, with all of this heavy duty service imposed upon it, it is estimated that it served but 60% of its life when removed. (The upper gear shows a new gear for comparison).

IXLITE TOOL HARD GEARS are produced by a special carburizing and hardening process which insures four times longer life than can be obtained by untreated gears.

75 years of gear designing and manufacturing are behind the remarkable performance cited above. The "step-by-step" inspection of IXL employees (90% of whom have been building IXLITE TOOL HARD GEARS for over 15 years) is a further demonstration that IXL will permit nothing but the highest quality to leave its shops.

Why not submit your tough gear problems to our engineering department?

Foote Bros. GEAR AND MACHINE CO.
5311 SO. WESTERN BLVD. CHICAGO, ILL.

(*Concluded from Page 70*)

at Atreco, near Beaumont, Tex., pipeline terminal of the company, will be completed and work begun about March 1. Cost is $3,000,000 exclusive of cost of erecting several large steel storage tanks at Neches river shipping point.

DALLAS, TEX.—Texas Electric Railway Co. has been incorporated by D. W. Milam and J. M. Burford.

HOUSTON, TEX.—American Can Co. of Louisiana, subsidiary of American Can Co., 230 Park avenue, New York, has leased 34,000 square feet of floor space at Commerce, Kendall, and Drennan streets, for distribution for all Texas. The company has office space in Bankers Mortgage building.

KINGSVILLE, TEX.—Chamberlain & Strain, National Bank of Commerce building, San Antonio, Tex., wants mixers, engines, pumps, trucks, and hoists, for water lines and sewer disposal plant, this city.

LONGVIEW, TEX.—Cushing Drilling Corp. has been incorporated by Edith and L. F. Long.

MOORE, TEX.—United Carbon Co., Charleston, W. Va., is planning the construction of a carbon black plant, to cost $30,000 or more.

TEXAS CITY, TEX. — Petrotex Co. has purchased the old Sinclair refinery here and will begin operations in February. A Donnelly cracking unit of 5000 barrels capacity will be built to produce a high octane blending naphtha. The company is a subsidiary of the Independent Terminal Co., this city, of which Marion Travis is president.

TEXAS—Bureau of aeronautics, department of commerce, Washington, has approved development of 34 additional airports in this state. Locations and amounts to be expended include: Brownsville, $20,848; Dallas, $362,852; Sweetwater, $45,700.

Wisconsin

MANITOWOC, WIS. — Heresite & Chemical Co. has been incorporated by Charles H. Hempel, former associate of Aluminum Goods Mfg. Co. here, to manufacture metal coatings and finishes. Plant has been established in former Martz knitting mill.

MILWAUKEE—Richard W. Werner, 1614 East Royall place, has organized Werner Mfg. Co., to manufacture tools, dies, machinery, and automobile accessories. Plant facilities will be provided shortly.

MILWAUKEE — C. H. & E. Mfg. Co., makers of building equipment, sawrigs, etc., has moved into its new plant at 3849 North Palmer street. Frank F. Hase is president.

MILWAUKEE — Heil Co., maker of steel tanks, motor truck equipment, hydraulic hoists, etc., has purchased a former bridge work plant at Hillside, N. J., for semi-manufacturing and assembly plant to serve eastern trade. J. P. Heil is president.

MILWAUKEE — Work has been started by Monarch Tool & Die Works, now in leased shop quarters at 815 West Juneau street, on a factory of its own, at North Fratney street and East Vienna avenue.

Pacific Coast

SPOKANE — Ottowa Silver Mining & Milling Co., 401 Sherwood building, has been incorporated by W. R. Green and associates.

SPOKANE — Snowbird Mining Co., 218 Fifteenth avenue, has been incorporated by Ben J. Scott and associates.

VALE, OREG.—Voters have approved a $46,000 bond issue to help finance a proposed $70,000 natural hot water heating system. Balance of the money is expected from PWA funds.

COLFAX, WASH. — South Palouse Power & Light Co. has been incorporated by Elbert W. Jones and associates.

HOQUIAM, WASH. — Fire originating in the dryer building did $25,000 damage to the plant of the Harbor Plywood Co. recently. Machinery and stock were damaged by heat and water.

ARCADIA, CALIF.—City will soon take bids on 12,000 feet of steel pipe watermains, including valves and fittings, to cost $79,000. PWA has approved $35,428 grant. Currie Engineering Co., Anderson building, San Bernardino, Calif., is engineer.

HILLSBORO, OREG.—Construction of a $60,000 plant to produce alcohol for motor fuel is proposed by Industrial Distilleries Corp., recently organized by A. C. Forrester, Portland, Oreg., engineer, and associates.

CLARKSTON, WASH.—Washington Water Power Co. plans replacement of sections of the local water system, using steel pipe, in the near future. Grover Beckman is district manager.

HOQUIAM, WASH. — Grays Harbor Pulp & Paper Co. has plans in preparation for the erection of a $50,000 breakdown and chipping plant. Contracts will be awarded early in the year.

SEATTLE—K. R. Wilson Equipment Co. has leased a building at Western and John streets for manufacturing automobile and other equipment. William A. Gore is local manager.

SPOKANE—Chilapa Mining Co. Inc., 514 Realty building, has been organized by H. B. Smead and associates.

Dominion of Canada

COPPER CLIFF, ONT.—International Nickel Co. of Canada, R. C. Stanley president, plans an addition to its smelter, including two new furnaces, eight converters with auxiliaries, air lines and electrical equipment, and large new stack. Project will cost $6,000,000, and owner's engineers will supervise the work.

KITCHENER, ONT. — Grant Engineering Co., 1164 Beaver Hall square, Montreal, Que., is planning construction of a coking plant 3 miles east of the city on highway No. 7, to cost $800,000.

OTTAWA, CANADA—Early establishment of the polymerization process at the refinery of the International Petroleum Co. in Peru, is predicted by Leo C. McCloskey, vice president, Imperial Oil Ltd., 56 Church street, Toronto, Ont. Central western Canada would be served by Peruvian petroleum products imported through Fort Churchill on Hudson Bay, and the first steps in the project would be to increase the refinery capacity in Peru and place tankage at Churchill.

Top-Charged Melting Unit Handles Bulky Scrap

(*Concluded from Page 41*)

tion and locked into place.

Belief that the top-charge method of operation would not show as low a power consumption as that of the door-charge furnace, because it was thought considerable heat would be liberated and lost when the furnace roof was swung aside, has been disclaimed in actual practice. Even though the entire roof is swung to one side during the short interval required for charging, the saving of power made by the top-charge furnace is due largely to the fact that less radiation and convection heat losses occur due to the comparatively long time the door-charge furnace requires for charging. Furthermore, the bulk of the residual heat in the emptied furnace is in the shell refractory lining and hearth. Since residual heat is in the roof and the charge is dropped onto the hearth so quickly, little of the heat stored in the furnace body lining can escape.

A plant where the top-charge type furnace has been installed has made interesting studies on operating costs. This concern has found that the average three-year cost of basic refractories was about 30 per cent less than the fixed-roof furnace's refractory cost; even though at first it was felt that the swing-aside movement would involve serious refractory difficulties by tearing of the seals between the roof and bowl on a hot furnace each time the roof was moved. This same concern tabulated electrode consumption over a three-year period, also in comparison with an adjoining fixed-roof furnace of the same shell diameter and charging with the same materials, to find that electrode consumption was 14 per cent lower on the top-charge furnace. Another swinging-top furnace user has reported a saving of 7 per cent on electrode consumption.

Forum on Modernization

(*Concluded from Page 42*)

about an actual increase in production of 42.9 per cent.

If a 30 per cent reduction in time required for any operation can be obtained, the result will be a net profit on the additional investment of 20.9 per cent per annum, after depreciation at 20 per cent per annum. If the entire usable savings with the new equipment are applied to write off the additional investment, the machine would pay for itself, as stated above, in 29.4 months. Looking at it either way, the saving would justify the purchases.

Most plants have set standards for retirement of worn or obsolete equipment but by computing the saving step by step, as above outlined, a definite answer can be obtained in every case.

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RATES FOR LARGER SPACE OR LONGER PERIODS FURNISHED ON REQUEST

"Healthy" Market Points to Continuing Good Business

WHILE sales of used and rebuilt equipment are holding at somewhat lower volume than in the closing months of 1935, they are well diversified and the market is characterized by what is termed a "healthy" condition. Individual orders as a rule are light, but a wide range of industries in scattered manufacturing districts are regularly in the market for used equipment—a planer here, a boring mill here, a milling machine somewhere else.

Continued deferred deliveries on new machine tools work to the benefit of practically all sellers of rebuilt machines.

Due to the fact that requirements of buyers usually call for special types of machinery, dealers are often hard pressed to locate desirable equipment. Auctions are watched closely, although at these most of the sales are to users who can afford to bid up prices beyond what a dealer can manage to pay and still realize a profit. In the next week or ten days, two large auctions of equipment in New Jersey will be attended by many buyers in the East. Leading dealers in rebuilt equipment also will be on hand, chiefly to observe what types of tools are in demand, but also to avoid missing the opportunity to snap up bargains.

Anyone who is interested in keeping tab on what is available at current auctions and receiver's sales will do well to read copies of *Auctions and Sales Record*, published each Monday, and listing many of the more important sales of equipment which are being conducted throughout the country. Not overlooking, of course, the many good buys which appear from time to time on this page.

Classified Advertisements

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WANTED SALES ENGINEER WITH EXPERIence in design of industrial ovens; sales experience preferred but not absolutely necessary; splendid opportunity for right man. Address Box 330 STEEL, Penton Bldg., Cleveland.

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DETROIT SALESMAN. FIFTEEN YEARS successful selling there. Graduate engineer. Practical Mechanic. Seeks sound line of Production Materials, Machinery, or Equipment. Commission basis preferred. Address Box 328, STEEL, Penton Bldg., Cleveland.

FORGE SHOP EXECUTIVE. EXCELLENT record production, management. Thorough knowledge dies, forgings, heat treating. Address Box 319 STEEL, Penton Bldg., Cleveland.

BAR—GUIDE MILL ROLLER, AGE 41. FIFteen years' experience, 800 sections, 1800 sizes Can install mill and can furnish references. J. J. Geisen, LaFayette, Ga.

STEEL JOBBER DESIRES CONNECTION with small steel mill as source of supply for primes and seconds—Chicago district. Address Box No. 327 STEEL, Penton Bldg., Cleveland.

EXECUTIVE EXPERIENCED METAL WORKing lines. Excellent record, production, management. Available January 1. Address Box 320, STEEL, Penton Bldg., Cleveland.

Positions Wanted

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With established business and acquaintance among manufacturers in Southwestern and Central Ohio. Interested in representing an additional Manufacturer of Steel or other Metal products in that territory. Commission basis. Address Box 316 STEEL, Penton Bldg., Cleveland.

SALES ENGINEER WITH SEVERAL YEARS' experience in equipment desires permanent connection with firm selling to industrial concerns. Excellent entree in Western Pennsylvania. Address Box 312 STEEL, Penton Bldg., Cleveland.

POSITION AS SUPT. OR MANAGER STRUCtural Steel, Ornamental Iron or Plate Shop, any size. Twenty-seven years experience in all branches, can furnish best of references. Will go anywhere. Write Box 307, STEEL, Penton Bldg., Cleveland, Ohio.

POSITION WANTED BY SALES ENGINEER— successful—experienced in both Machine Tool and General Machining. Has practical manufacturing experience. Available Jan. 1, 1936. Moderate salary and commission. Address Box 322, STEEL, Penton Bldg., Cleveland.

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